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Boeing's advanced research unit scopes out long-term technology trends. Page 70

THE IT POLICE

IT auditors face the derision and scorn of some techies but are vital to corporate performance. Page 50

SAFE AND SECURE

Get everyone involved in IT security, says Pete van De Gohm (left) of Enron Energy Services. Page 44

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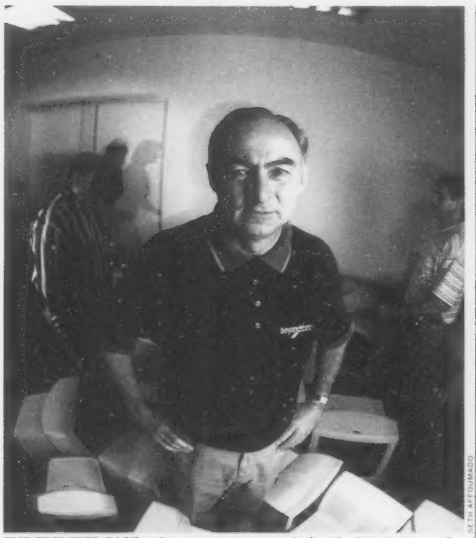

BETH ARTOMASO

THE FRENZIED PACE at Internet start-ups isn't the ideal environment for making long-term IT decisions, says Gordon Jones, CIO at Beyond.com

DOT-COMS ON THE EDGE

SO WHAT'S IT LIKE TO BE an IT professional at one of the growing number of cash-strapped dot-coms? Kim S. Nash talked to insiders and ex-employees and heard tales of budget crunches, staff departures and skimpy disaster-recovery plans. Not to mention the story of the rookie who strung the live cable to the Web server through a doorway, where (of course) someone tripped on it and . . .

Story begins on page 20.

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U.S. BANKS JOINING WIRELESS GOLD RUSH

Spate of announcements cite customer demand, heat from brokerages and portals

BY MARIA TROMBLY

Harris Bankcorp Inc. this week becomes the first U.S. bank to offer wireless service to its retail customers. And a slew of its competitors are close behind as wireless applications continue to build momentum toward mainstream markets.

And there's another driver: competition.

A number of brokerages, including Charles Schwab & Co., Merrill Lynch & Co. and ETrade Group Inc., as well as portals such as Yahoo Inc., have begun or plan to offer financial account aggregation, letting customers access their accounts from all the financial institutions with which they do business. That's a direct threat to banks.

"They have to offer wireless also or risk losing customers to ETrade," said George Barto, an analyst at Stamford, Conn.-based Gartner Group Inc.

Online brokerages began offering customers wireless services as long as three years ago, but U.S. banks haven't felt the demand to offer bill payment, balance inquiries and other services over mobile phones and personal digital assistants. These days, though, about 30%

Wireless, page 89

Unplugged

U.S. banks are beginning to offer wireless banking

Harris Bankcorp, *Chicago:*	This week
Citicorp, *New York:*	This summer
Bank of America, *Charlotte, N.C.:*	This summer
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Wachovia, *Winston-Salem, N.C.:*	Early fall

DEVELOPERS VOICE .NET SKEPTICISM

Scope of overhaul one reason for concern

BY LEE COPELAND
ORLANDO

Microsoft Corp. faced a daunting task last week: persuading 6,000 developers to stick with its tools for the next two years while it follows through on the Microsoft.Net vision.

Most of the faithful at the Microsoft Professional Developers Conference here appeared to be dazzled by glimpses of the Microsoft.Net framework and accompanying tools. But they voiced skepticism about Microsoft's ability to execute a strategy that requires a massive overhaul

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IRIS SCANS TAKE OFF AT AIRPORTS

Officials report no protests about eye ID

BY MICHAEL MEEHAN

In one of the first public applications of eye-scanning technology, two airports this week will begin scanning passengers' irises as part of an effort to streamline boarding and security processes.

Using video cameras to scan the iris — the colored ring that surrounds the pupil in the human eye — EyeTicket Corp. in

Scanning, page 14

CIOs VEXED BY NEW LICENSING DEALS

Fear long-term costs of finite-term contracts

BY DOMINIQUE DECKMYN

Buying software may soon be a thing of the past, with vendors such as Oracle Corp. and Microsoft Corp. starting to move customers to subscriptions and finite-term licenses. But some CIOs said they are alarmed at what these new arrangements could cost, despite the benefits.

BOB SCHWARTZ: "Negotiating skills are crucial"

Some worry about the risks of not having a perpetual license. "It's a terrible deal, because at the end of your contract they could double the price," said Rocco Esposito, IT director at Hunter Douglas Inc., a 14,000-employee manufacturer of window coverings in Upper Saddle River, N.J.

Analysts predict that subscription and term licenses will increasingly replace the traditional perpetual soft-

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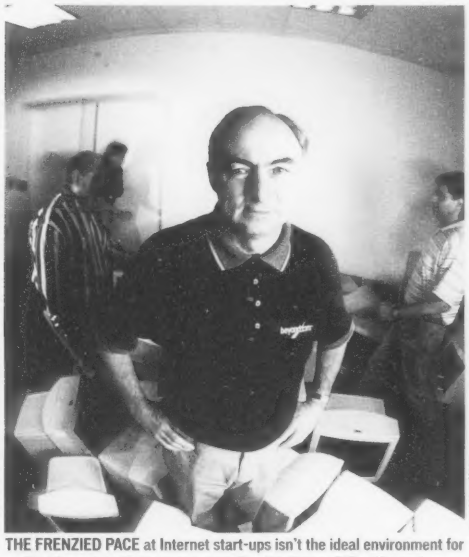

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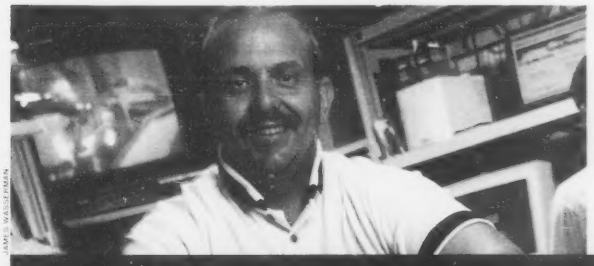
REVENGE OF THE DOT-NOTS

Stock-optionless companies are finding new ways to outcompete dot-coms for talent. Gary Habermann (below) at Widener University offers high-tech "toys" and free tuition. Page 42



7 WAYS TO HIRE AN IT LEADER

An attractive pay package alone won't bring in the IT executive you want. You have to think about such things as having top-level commitment to technology and providing adequate technological and financial support for IT to do its job. Page 48

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10 DISNEY ENDS controversy by agreeing to buy and retire Toysmart's customer list.

12 DOCTORS ARE venturing onto the Internet for research, but they still shy away from online communication, a study finds.

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68 MANY IT STORAGE professionals are building the management tools they need.

70 BOEING'S ADVANCED research unit looks for and deploys new technology.

This Week Online

■ This week, exclusively on **Computerworld.com's Careers Page**, Congressman Lamar Smith (R-Texas) discusses legislation he filed that would require **H-1B visa** holders to have college degrees.

■ Also, see **Dominique Deckmyn's Reporter's Notebook** from Microsoft's Professional Developers Conference, posted on our **Windows 2000 Community Page**.

■ And on the **B-to-B/E-Commerce Community Page**, Andrew Shen at the Washington-based Electronic Privacy Information Center, discusses the potential fallout surrounding **Toysmart's** plan to sell its customer lists.

OPINIONS

30 MARK HALL argues that vendors make software licensing unnecessarily complex.

30 DON TAPSCOTT finds that the Internet is turning the world of marketing topsy-turvy.

31 DON TENNANT says Larry Ellison is onto something after hiring ABC News technology correspondent Gina Smith to lead the charge for his New Internet Computer.

33 JOHN GANTZ says IT organizations that measure success in hiring people can have a leg up in the recruiting wars.

33 WILLIAM M. ULRICH says IT organizations must not forget legacy business rules in Web-based environments.

40 ALAN PALLER offers some questions IT organizations should ask of their information security officers.

52 KATHLEEN MELYMUKA tells of a San Francisco program that helps women learn technology skills.

90 FRANK HAYES says that Microsoft's upcoming .Net means the end of the PC as we know it.

AT DEADLINE

U.S. Reps Move to Limit Use of SSNs

U.S. representatives said Friday that they plan to introduce a bill that would restrict government and business uses of Social Security numbers, mirroring a similar proposal made in the Senate last month. The bills aim to curb identity thefts but could burden companies that rely on Social Security numbers for uses such as credit approval.

WorldCom, Sprint Kill Merger Proposal

WorldCom Inc. and Sprint Corp. last week said they would drop their proposed $120 billion merger. The U.S. Department of Justice's lawsuit to block WorldCom's acquisition of Sprint, along with opposition from European regulatory officials, made pursuit of the merger unreasonable, the two companies said.

Auto Groups Sue to Sell Over Internet

Two trade associations for automakers last week filed a lawsuit in federal court against the state of Arizona, seeking to block a dealer-franchise law that prohibits car manufacturers from selling directly via the Internet. The Alliance of Automobile Manufacturers and the Association of International Automobile Manufacturers claim the law hurts consumers by restricting services automakers can offer online.

Short Takes

EUROPEAN UNION official Frits Bolkestein said he won't change his recommendation that "safe harbor" data-privacy rules be adopted as-is, despite a request for changes from the EUROPEAN PARLIAMENT (see related story, page 24). . . . In a surprise move, one week after warning that its second-quarter revenue and profits would be less than expected, INFORMIX CORP. ousted CEO Jean-Yves Dexmier and named board member Peter Gyenes his replacement. . . . Educational, financial and cultural barriers are keeping minorities and women out of high-tech jobs, a congressional commission said in a report last week.

IBM's Freeway Could Ease Software Costs

Firm's first 64-bit S/390 will enable per-processor, usage-based pricing

BY JAIKUMAR VIJAYAN

FOR ALL the technology improvements expected in IBM's upcoming Freeway mainframes, the big impact on users will be from the changes they promise to bring to big-iron software pricing models, analysts said.

Freeway is the code name for IBM's first 64-bit S/390 mainframes, which are expected to start shipping in the fall.

The systems will have a performance of around 256 MIPS per processor, and a fully configured Freeway system will deliver around 3,000 MIPS of performance, according to estimates by David Floyer, an analyst at ITcentrix Inc., a mainframe consultancy in Mountain View, Calif.

Freeway systems will combine better memory management capabilities with raw technology improvements — such as support for more processors and faster interconnects between them — to deliver double the performance of current Generation 6 S/390 mainframes, said Floyer.

One of Freeway's primary draws will be its ability to let users tie application workloads to specific processors or sets of processors within a mainframe in a way that is verifiable and measurable for both vendor and user, said one user who asked not to be named.

Users have long complained that it's unfair that capacity-based pricing models force them to pay for software based on the size of their overall mainframe complex rather than on its actual use (see chart).

IBM's new mainframe technology should help such users by letting them partition their mainframes into multiple servers and run separate applications on each partition.

Such clearly demarcated partitions make it possible for vendors to charge for their software based on the portion of the mainframe it's running on — and on the actual use of such software. The ability to measure application usage will also facilitate more usage-based pricing schemes in the future.

"In general, I would say these kinds of pricing models would be very beneficial to users if they are implemented correctly," said Ronald Theilen, president of Share Inc., a large-system user group in Chicago.

Even so, a lot will depend on the willingness of independent software vendors to go along with such pricing schemes, said Rich Smrcina, a systems software specialist at Grede Foundries Inc., a $600 million producer of metal castings in Milwaukee. IBM rival Amdahl Corp. in Sunnyvale, Calif., for instance, has been offering a similar capability with its Multiple Server Facility for more than two years. But so far, few of the major independent software vendors have changed their pricing practices.

There's Gotta Be a Better Way

An example of why users want alternatives to capacity-based pricing:

- **A user has three separate applications** running on three separate 100-MIPS mainframe systems.
- **With capacity-based pricing,** moving the applications to a single larger 300-MIPS box will push license fees up on all applications.
- **Even though each application still consumes only 100 MIPS,** software vendors assess fees based on the 300 MIPS of the overall box.

Insurer to Cover Losses From Net Breaches

Lloyd's of London backs Counterpane plan

BY ANN HARRISON

Businesses are insured against many types of disasters, so why not Internet security failures, too?

Counterpane Internet Security Inc. in San Jose announced last week that it will offer as much as $100 million in insurance coverage to protect companies against loss of revenue and information assets caused by Internet and e-commerce security breaches.

Counterpane's warranty of service is backed by Lloyd's of London and underwritten by New York-based insurance broker Frank Crystal & Co. and London-based Safeonline Ltd.

Risk Control

Other insurers offer policies that pay for losses under loss-of-business or act-of-vandalism clauses, but damages are often difficult to collect and premiums begin at $100,000. Counterpane said it's the first security services provider to offer guaranteed, direct financial reimbursement for security-related losses, for premiums of $12,000 to $20,000.

Lloyd's security insurance covers the cost of repairing and replacing data or software following a security attack. It also reimburses lost revenue following a service interruption and offers extortion protection for payment of ransoms.

SCHNEIER'S Counterpane is filling an insurance gap

"Until now, the insurance industry has not had sufficient assurance of risk control from security companies," said Bronek Masojada, CEO of Lloyd's insurer Hiscox PLC in London.

"Now, Counterpane has proven to us, through their Managed Security Monitoring service, that they have substantially reduced their clients' exposure to risk. This has allowed us to broaden the coverage and increase the amount and availability of our insurance to Counterpane and their customers," Masojada added.

David Tapper, a research analyst at International Data Corp. in Framingham, Mass., noted that a number of Counterpane's competitors, including Internet Security Systems Inc. in Atlanta, Hewlett-Packard Co. and IBM, have also formed partnerships with insurance companies. Tapper said the trend has helped push the creation of insurable models of security management.

Unlike other outsourced security services that monitor only firewall or intrusion-detection systems, Counterpane offers managed, around-the-clock incident-response services to help companies react to security incidents.

Counterpane is built on the reputation of its founder, Bruce Schneier, a world-respected cryptanalyst.

Method of Understanding

Counterpane has two secure operations centers to monitor customers' networks through encrypted tunnels. Probes on networks collect information from security products.

Conxion Corp., an Internet service provider and Web hosting firm in Santa Clara, Calif., pays Counterpane $150,000 per year to monitor its networks and is exploring the possibility of purchasing a policy.

"Here is a method to understand how the premium structure is going to work and how the risk factors are going to affect your data and information network," said Mark Kadrich, director of security at Conxion.

Quick, Who Offers The Best Tools For DB2?

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Retailers Pick Team For Online Market

But analysts warn that challenges remain

BY CAROL SLIWA

THE WORLDWIDE Retail Exchange announced last week that IBM, i2 Technologies Inc. and Ariba Inc. will help build, operate and host the online marketplace where exchange members plan to purchase goods and supplies and collaborate on supply-chain issues.

STORCH SEES "enormous" potential savings

Launched in late March, the venture eventually could become one of the larger business-to-business marketplaces, given that its 22 members include major retailers such as Albertson's Inc., Best Buy Co., CVS Corp., J. C. Penney Co., Kmart Corp., Rite-Aid Corp., Safeway Inc., Target Corp. and Walgreen Co.

But analysts warn that the WorldWide Retail Exchange effort — a competitor to the GlobalNetXchange that Sears, Roebuck and Co. and French grocer Carrefour SA launched this year — faces an array of challenges, from getting different technology partners and products to work together to getting data to flow into disparate back offices.

Integration Problems

"The problem is the integration. There are a lot of moving parts in the technology stack within this exchange," said Pierre Mitchell, an analyst at Boston-based AMR Research Inc. "The other is you're going to have to get the technology partners to work comfortably together."

IBM will do the hosting and systems integration, and Dallas-based i2 and Mountain View, Calif.-based Ariba will bring several applications to the table. Plans also call for products from Syncra Systems Inc., ViaLink Co., QRS Corp. and Retek Inc. to be used.

"Even with a good set of hosted, integrated applications to power the exchange, you still need to integrate it into the back office, and the back office is ugly for retailers," said Mitchell. "They have mainframe-based merchandising systems and a hodgepodge of other legacy applications and custom applications."

Despite the challenges, member retailers have high hopes that "virtually all" of their transactions will go through the exchange within three to five years and perhaps sooner for some, said Jerry Storch, president of financing and new services at Minneapolis-based Target.

Storch said the biggest savings will come from removing supply-chain inefficiencies.

One key benefit of sharing information will be compressing design-to-production cycles, he said. "We work like crazy now just to shave a week or two off," Storch said. "If we could shave a month, you'd save an enormous amount of money."

Members of the WorldWide Retail Exchange plan to launch the exchange in phases.

Within 30 days, the group will introduce auctions and will start to put together tools for electronic procurement and supply-chain applications.

Within 90 days, collaborative planning and forecasting needs will be addressed.

More sophisticated customization capabilities are due in 180 days.

Analyst Andrew Bartels at Cambridge, Mass.-based Giga Information Group Inc., said, "It's absolutely unrealistic to expect that 100% of a company's transactions are going to go through these marketplaces." He said some companies will still prefer bilateral systems for security and dedicated phone lines to ensure that all transactions go through.

The members of the WorldWide Retail Exchange chose the IBM/i2/Ariba team in a close call over Andersen Consulting Group, Microsoft Corp. and Commerce One Inc.

"The breadth and scope" of products offered by IBM, i2 and Ariba influenced the group's decision, said Patrick Steele, who is the executive vice president of information and technology at Albertson's and the head of the exchange's technology committee. ◗

ACLU Fights Fed E-Mail Scans

BY ANN HARRISON

The American Civil Liberties Union (ACLU) is calling on Congress to update federal privacy laws and ban what it says is the potential for large-scale scanning and analysis of e-mail by the FBI's Carnivore e-mail interception program.

While the FBI says Carnivore can target the traffic of just one individual, critics say the potential for abuse is high because it's attached to an Internet service provider's network and can analyze all traffic as it passes through.

Carnivore is permitted by a Title III court order that allows the FBI to intercept the contents of electronic communications of a specific person. Investigators can also get a tap-and-trace or pen-register order to collect the "numbers" related to communications to and from the suspect.

But unlike a conventional phone wiretap that gathers just phone numbers, this type of surveillance on the packet-switched Internet allows the gathering of e-mail addresses, e-mail header information and other data, including Internet provider addresses, dial-up numbers and e-mail logs.

"There isn't any clear law that authorizes tap-and-trace devices to the Internet, and even when they have an order to get the content of the information, there is certainly no law that allows them to attach devices to an ISP's network to filter all communications," said Barry Steinhardt, associate director of the New York-based ACLU.

Steven Berry, an FBI supervisory special agent, said Carnivore limits viewable messages to only those included in a court order. The bureau says Carnivore has been used in fewer than 100 criminal cases in the past 18 months. "It is a very surgical tool and offers extreme precision on those communications that are subject to interception," Berry said. "The tool is necessary to meet the stringent requirements of federal wiretapping statutes."

But Susan Landau, a senior staff engineer at Sun Microsystems Inc. and co-author of the book *Privacy on the Line: The Politics of Wiretapping and Encryption*, said the FBI is trying to apply an old law to new technology that carries more information and has greater potential impact on users. "What we are relying on is the FBI not saving the information even if it sees it." ◗

ABA Panel Calls for Global Internet Laws

Says laws must cover all nations for Net to thrive

BY TODD R. WEISS

An American Bar Association (ABA) committee last week said laws around the world need to be unified to give the Internet a solid legal structure for e-commerce transactions.

A 100-member ABA committee that has spent two years reviewing online legal and jurisdictional questions issued a report recommending the formation of a "global online standards commission" that would establish a legal framework for the future of e-commerce and oversee international Internet disputes.

Mike Parris, a spokesman for Ford Motor Co. in Dearborn, Mich., said global online laws would be helpful for consumers and for Ford as it considers selling automobiles and trucks via the Internet.

"I think you'd find us supporting some form of standardization certainly," Parris said. "It's wild out there."

Al Manning, a spokesman for the Washington-based ABA, said the report from the group's Global Cyberspace Jurisdiction Project shows that new legal structures are needed to keep up with changes in technology.

"The current jurisdictional system is based on geography," so each country's laws end at its borders, Manning said. The Internet, however, "is not based on geography," he added.

The first step to maintaining legal rights and responsibilities in an e-commerce world is through the creation of worldwide standards, Manning said.

Edward Black, president of the Computer & Communications Industry Association, in Washington, said the idea is right for the times. "We know we've somewhat left the old world and we're in a new world," Black said. "I think we would approach it with interest and curiosity, yet with reservation and restraint." ◗

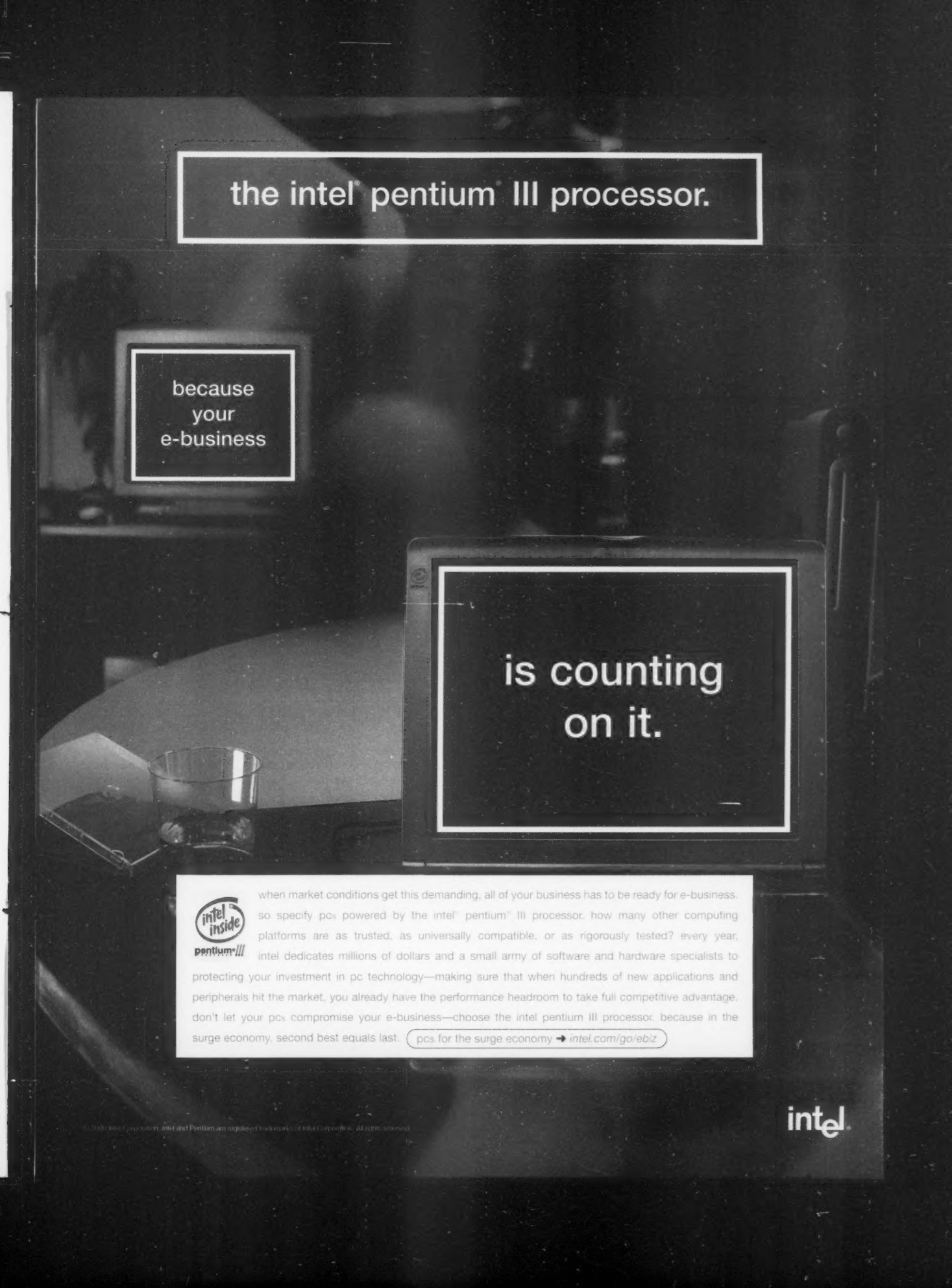
What's on the Agenda?

Activities a global standards commission could consider:

Creating a worldwide cybertribunal and voluntary industry councils for e-commerce disputes

Encouraging safe-harbor agreements for jurisdictional conflicts in cyberspace

Helping apply laws to financial products and services offered in electronic environments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BRIEFS

Compaq, Seagate Face Disk Drive Suit

Convolve Inc., a New York-based maker of patented motion control technology, and MIT filed a lawsuit last week seeking $800 million in damages against Compaq Computer Corp. and Seagate Technology Inc. The lawsuit alleges that Houston-based Compaq and Scotts Valley, Calif.-based Seagate misappropriated Convolve's Input Shaping technology, which allows disk drives to run more efficiently and quietly. Input Shaping was created by Convolve using patented technology under license from MIT.

Motorola Profits Lag; Revenue Accelerates

Motorola Inc., the world's No. 2 cellular phone maker and sixth-largest semiconductor company, said second-quarter net income fell to $204 million, or 9 cents per share. In the same period a year ago, net income was $255 million, or 12 cents per share, adjusted for a 3-for-1 stock split. Sales rose 22% to $9.26 billion, up from $7.6 billion last year.

Dell Shuts WebPC Line

Dell Computer Corp., in response to disappointing sales of its consumer-only WebPC line, halted sales of the machines just seven months after their introduction. The three-model line was the Round Rock, Texas-based business PC maker's first purely consumer-oriented PC.

Aspect Stock Plunges

Shares in Aspect Communications Corp., the San Jose-based maker of customer service software, plunged after the company warned that second-quarter profits would fall short of expectations and suffered two downgrades of its stock.

New Export Controls

The U.S. Senate last week voted 86-11 to cut the time it takes to approve new export controls for high-performance computers from six months to 60 days. It mirrors a similar vote by the House in May.

Are Employers Liable For Use of Napster?

Sharing music at work ill-advised, but copyright suits unlikely to extend to users

BY PATRICK THIBODEAU

ALAN RHEA, an information systems director at U.S. Diamond Wheel Co., said he doesn't want his end users installing Napster Inc.'s software on their computers. Its file-sharing technology poses a security risk, and personal use of work computers violates company policy.

But, otherwise, Rhea said, he loves Napster.

From his home PC, Rhea said, he uses Napster to listen to new artists and to track down hard-to-find music such as a digital recording of the first 45 RPM record he ever bought — "Tell Her No" by The Zombies.

"I think Napster is one of the best promotion tools that ever came out of the Internet for music, and it's a shame that you got some people driving Lamborghinis saying that it's going to make them paupers," said Rhea, whose Oswego, Ill.-based company makes abrasive products.

San Mateo, Calif.-based Napster may soon be shut down if San Francisco Federal District Judge Marilyn Patel agrees to a preliminary injunction sought by the recording industry. A hearing is scheduled for July 26. Napster has argued that its users are simply — and legally — "sharing" music for personal use. But the Recording Industry Association of America, which is representing the major record labels in court, says Napster is helping users violate copyright law.

Potential Liability

This battle has created a legal gray area for Napster users — and potentially for their employers as well. If employees use work computers to download copyrighted digital recordings, employers could be dragged into a lawsuit if record labels start suing some of Napster's 20 million users, said several intellectual-property attorneys.

But even if the record labels could legally justify suing end users, the record companies "would be hard-pressed to hold an employer liable," said Jeffery Lewis, an attorney at Gordon & Glickson LLC in Chicago. Regardless, it's important for companies to have rules and policies on equipment use in place, he said.

However, legal experts said they don't believe the recording industry will start alienating its customers.

METALLICA'S LARS ULRICH (left) appeals to Napster CEO Hank Barry at a Senate hearing

"The music industry would be insane to sue individuals . . . [but] that doesn't mean they might not be insane," said attorney James Burger at Washington-based Dow, Lohnes & Albertson PLC.

Congress has begun probing the copyright and competition issues raised by Napster and businesses such as MP3.com Inc. in San Diego.

At a U.S. Senate Judiciary Committee hearing last week, Metallica drummer Lars Ulrich derided Napster for violating copyrights. At the same hearing, Roger McGuinn, formerly a member of the folk rock group The Byrds, praised MP3.com, and Internet downloads in general, for exposing more people to his music.

But Gene Hoffman Jr., president, CEO and founder of EMusic.com Inc. in Redwood City, Calif., which sells digital music online, said the company has seen its stock value plunge from more than $20 per share to around $2 per share because of Napster. "[Investors] are afraid that Napster will validate the concept of not paying for music," he said.

New Domains May Bring New Problems

BY PATRICK THIBODEAU

A plan to expand generic top-level domains beyond the familiar .com, .net and .org may be a mixed blessing for businesses.

The Internet Corporation for Assigned Names and Numbers (ICANN) — a Marina del Rey, Calif.-based nonprofit organization that's responsible for administering the domain name system — was expected to consider adding new top-level domains at a meeting due to wrap up early this week in Yokohama, Japan.

New domains — especially generic domains such as .shop — would mean that companies that now have to deal with .com cybersquatters would have a lot more virtual territory to worry about. That prospect "is something that's the nightmare of every brand owner, certainly," said Sally Abel, an intellectual-property attorney at Fenwick & West LLP in Palo Alto, Calif.

On the other hand, businesses that have lost out on getting the best .com names would have a new shot at an attractive name in a different domain.

Name Game

But the importance of a catchy or simple-to-remember domain name in establishing a business is debatable, said Gary Szenderski, a senior partner at brand development and advertising firm Szenderski Rohani Worldwide in Irvine, Calif.

"A brand is only as good as what's behind the name," said Szenderski. "[Companies] that have established .coms are going to remain established."

Observers said ICANN also may introduce a series of "chartered," or closed, domains that limit registrations to specific companies or organizations — like .airline, for example. These domains would be limited in much the same way .edu has been restricted to educational institutions.

But closed domains could raise other issues. For example, the Labor Policy Association Inc. in Washington, which represents human resources executives at major corporations, has sent a letter to ICANN opposing the introduction of a .union domain. The group claims that the domain could confuse employees and lead them to believe they're being represented by unions formed by their companies. But proponents say a .union domain such as Nike.union or Microsoft.union could help foster communication among workers.

Trademark protection remains a major issue for ICANN. The group has tried to make it easier for firms to take trademarks from cybersquatters through its Uniform Domain-Name Dispute-Resolution Policy. The policy provides a mechanism for the World Intellectual Property Organization in Geneva to use in arbitrating domain name disputes. But the system works only after trademark infringement is alleged.

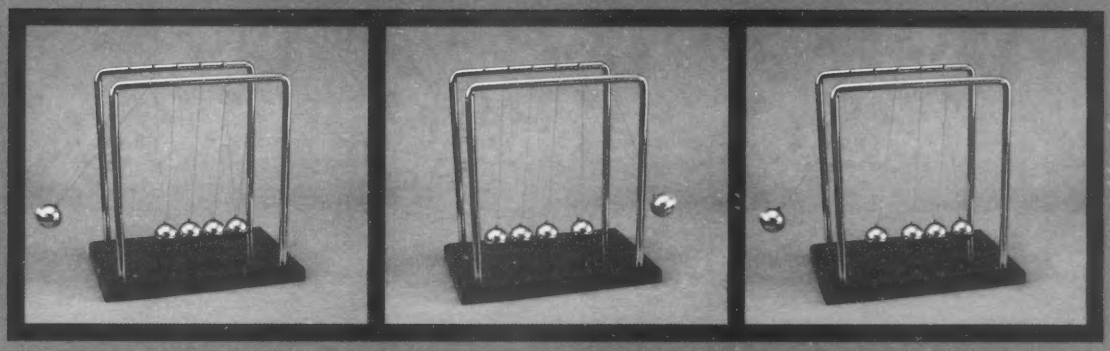
So far, ICANN's members have been unable to agree on an alternative plan to provide trademark protection.

Domain Facts

There are seven top-level domains: .com, .net, .org, .edu, .int (for international organizations), .gov and .mil (for military services).

There are more than 200 country code domains, such as .us for the United States.

According to Network Solutions Inc., the **average length of a domain name is 11 characters.**



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Disney: We'll Retire Toysmart Customer List

BY JENNIFER DISABATINO

On the heels of a federal lawsuit filed against Toysmart.com Inc., The Walt Disney Co. said it will offer to buy the customer list of the failed online toy retailer to maintain the privacy of the Web site's customers.

Last week, the Federal Trade Commission (FTC) filed suit to stop Toysmart from selling its customer list and related information in violation of the privacy policy that appeared on the company's Web site.

Toysmart hasn't yet received a formal offer from Disney to buy the list, said Alex M. Rotolakis, a Boston-based attorney at the law firm Hanify & King PC, which is handling the bankruptcy proceedings for Toysmart.

Disney, which owns 60% of the retailer, said in a press release that it plans to retire the list to protect customers' privacy. "Ultimately, it's probably a cheap way for Disney to save face" on its failed investment in Toysmart, said Alan Alper, an analyst at Gomez Advisors Inc. in Lincoln, Mass.

Customer information for the site includes the names, addresses and ages of customers and their children.

Frank Prince, an analyst at Forrester Research Inc. in Cambridge, Mass., said the FTC is likely to take a hard stance on the issue.

Ground Rules Needed

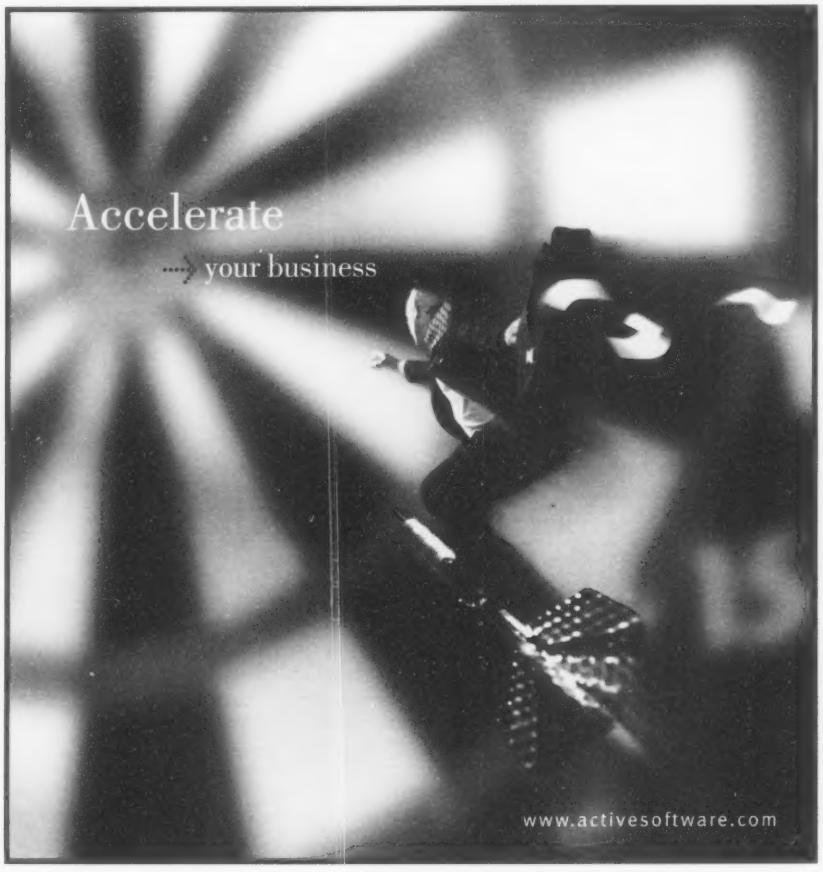
"There is considerable sentiment in the privacy advocacy community that the privacy guarantees that are currently in place are often not honored," said Prince. He said he believes the Toysmart case will become "pivotal" in establishing ground rules for privacy, because it should determine "whether the letter of the contract as opposed to the spirit of the contract will be honored."

The controversy over the proposed sale began early this month when Truste, a San Jose-based organization that signs up companies that agree to adhere to a set of online privacy guidelines, said it planned to submit a legal brief asking the bankruptcy court in Boston to withhold its approval for the proposed sale.

Truste officials also registered a complaint with the FTC, which triggered the commission's investigation. Truste had licensed Toysmart to put the Truste privacy seal on its Web site, provided that the Waltham, Mass.-based company never divulged customer information to a third party.

Disney said it's willing to buy the list subject to the approval of the bankruptcy court. If Disney isn't allowed to buy the list, the company said it will urge the court to permit a sale only to a buyer that would maintain the confidentiality of consumers who submitted personal information to Toysmart.

FTC spokesman Eric London wouldn't comment on the suit or any investigation but did say negotiations with Toysmart are continuing.



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* Source: Media Metrix, May 2000

Doctors Go Online for Research, Little Else

Many question savings potential, hesitate to communicate via Internet

BY JULEKHA DASH

ONLINE HEALTH firms are increasingly targeting physicians with new services. But are doctors likely to catch Web fever?

It depends on the type of service companies offer, according to a survey of 250 primary care physicians released last week by Ziment, a New York-based market research firm. The study found doctors are more likely to use the Web for gathering information about drugs and medical treatments than for communicating with patients, writing prescriptions or filing insurance claims.

Less than one-third of the doctors surveyed said they believe the Internet will save the health care industry money over the next five years. And less than half said they believe it will improve communication between physicians and patients.

Killer Apps

But physicians did express significant interest in two developing technologies. 41% said they were very interested in using the Internet to practice medicine remotely, such as through an audiovisual link.

And when asked to name the "killer app" that could most transform the practice of medicine or improve the quality of care, 21% said "online access to medical records."

Talbert Medical Group in Costa Mesa, Calif., relies on Newport Beach, Calif.-based The TriZetto Group Inc. for a number of online health services, such as Web hosting and Internet portal development.

But Dr. John Jacomo, a family practice physician affiliated with Talbert, said he is skeptical because some patients may send e-mail to doctors "when they should call 911."

Health care analysts say online health applications will gain converts among physicians if they save time and money.

"It's difficult to get physicians to adopt [technology] if it doesn't support their practice" or clinical work, said Doug Johnston, an analyst at Forrester Research Inc. in Cambridge, Mass.

The Voice of Authority

Physicians also said that while they use a variety of online health content providers, they generally rely more heavily on content that has been reviewed by an authoritative medical body.

Dr. Marc Lowen, an obstetrician/gynecologist at a five-physician practice in Baltimore, uses a health content service from San Francisco-based Medem Inc. (which last week announced it will outsource its Web hosting to Beltsville, Md.-based Digex Inc.) partially because it's backed by a number of medical societies, including the American Medical Association. Lowen said the fact that Medem prescreens its health information saves him time.

"I spend a lot of time during office hours making sure that the information [patients are] getting is appropriate," said Lowen.

Time savings were also behind WellStar Health System's decision to purchase a physician practice management system from Atlanta-based InfoCure Corp. for more than 250 physicians.

After reviewing products from about a half-dozen online vendors of health-related services, the Atlanta-based health care organization chose an application that allowed physicians to create ad hoc financial or clinical reports, according to Sally Eckford, director of physician information services at WellStar.

Now, she said, "it takes about a month to get to all the reporting requests."

Examining the Web

What physicians use the Internet for:

Gathering information about drugs	75%
Medical treatments	68%
Communicating with patients	20%
Writing prescriptions	19%
Filing insurance claims	12%

Base: 250 primary-care physicians

SOURCE: ZIMENT, NEW YORK

Cyberdoctors

Services that selected online health companies offer:

TriZetto Group Application hosting, Web portal, online content, e-commerce, administrative tasks

Medem Online content, secure messaging under way

Healtheon/WebMD Online prescriptions, lab orders, claim submissions, continuing medical education

Senate Studies Airline E-Ticketing Venture

Critics: With most major U.S. carriers on board, Orbitz could turn into a cartel

BY MICHAEL MEEHAN

The U.S. Senate Commerce Committee has set a new date of Thursday for a planned hearing on potential antitrust issues involving the Orbitz online ticketing venture that's being funded by the nation's five largest airlines.

The hearing originally was scheduled to take place last month, but it was delayed after the announcement of a proposed merger between United Air Lines Inc. and US Airways Group Inc. — a deal that took higher priority on the Senate committee's schedule. Orbitz is also being investigated by the U.S. Department of Justice.

The Senate hearing will revolve around questions such as whether United, American Airlines Inc., Continental Airlines Inc., Delta Air Lines Inc. and Northwest Airlines Inc. should be able to band together to sell tickets in competition with existing online and brick-and-mortar travel agencies.

Jeffrey Katz, who was hired earlier this month as president, CEO and chairman of Chicago-based Orbitz, is expected to testify at the hearing, although a final witness list hadn't been released at press time. Katz hasn't discussed the antitrust accusations in a public forum. But Alex Zoghlin, chief technology officer at Orbitz, last month said the company will act like any other online travel agency that does business with multiple airlines.

Since the Commerce Committee and the DOJ announced their separate probes of Orbitz, a second online venture funded by many of the same airlines has announced its plans to challenge Priceline.com Inc. in the discount ticket business. But that company, Hotwire, differs from Orbitz in that its airline investors only own nonvoting shares and aren't represented on its board of directors.

Paul Ruden, senior vice president of legal affairs at the American Society of Travel Agents Inc. (ASTA), which asked the government to investigate Orbitz, said he intends to testify at this week's Senate hearing. Ruden said the Hotwire plans only add to the competition concerns ASTA members have about the new ticketing ventures.

"We now have the major airlines moving jointly into every dimension of the marketplace," Ruden said. "It has the potential to create a cartel run by a concentrated few carriers."

Henry Harteveldt, an analyst at Forrester Research Inc. in Cambridge, Mass., said he expects government officials to compare the organizational structures of Orbitz and Hotwire as part of their investigations. "At the very least, Orbitz should be forced to reveal [details about the airlines'] ownership," Harteveldt said. "Who owns what and how much? It never looks good when you hide anything."

JUST THE FACTS

OPEC of The Airways?

What is Orbitz? An online travel agency funded by the nation's five largest airlines. Another 30 airlines have signed on as nonequity partners. A launch is expected later this summer.

What's the problem? Opponents of the plan claim the airlines will act as a cartel, establishing their prices as a unit rather than as competitors, with higher prices to the consumer being the end result.

What's the defense? Orbitz executives say the company's main advantage will be technological superiority. They also say the airlines won't be able to collude on pricing.

What's at stake? Many other industries, including automakers and meat packers, are seeking to create similar online sales channels. Some see it as a cheaper way of moving products. The government eventually must decide whether this type of e-commerce efficiency helps consumers or hurts them by eliminating the fundamental premise of competition.

Discounts a Key Issue

Harteveldt added that ticket discounts will be a central issue in the Orbitz debate. If Orbitz can undersell its competitors or seeks to eliminate the discounts offered through competing channels, it could raise red flags, Harteveldt said.

Analyst Fiona Swerdlow at Jupiter Communications Inc. in New York, said the real issue is that airlines have used technology to become more aggressive about controlling the distribution channel for their tickets.

"Any and every avenue the airlines will explore," Swerdlow said. "Honestly, it's just too early to tell what the effects of that will be."

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Biometrics Meet Wireless Internet

Unit will bring fingerprint IDs to handhelds

BY JAIKUMAR VIJAYAN

IDENTIX INC. — a Motorola Inc.-funded maker of fingerprint identification devices — last week launched a division that will offer biometric authentication services to wireless and Internet service providers.

The technology will allow customers of wireless services and products to authenticate their identities when conducting electronic transactions, according to Identix.

Services such as these will become increasingly crucial as wireless use and applications grow, said Jeff Keffler, an analyst at Lehman Brothers Holdings Inc. in New York. Lehman estimates that 140 million handsets will be sold next year.

Identix's new division, Itrust, will build both the hardware and software for the fingerprint scanning devices that will be embedded in such handheld devices. Itrust will also bundle a range of validation, transaction management and content protection services based on the devices, said CEO Jim Scullion.

Transaction management services can handle tasks such as maintaining audit trails to prove that a transaction did indeed take place. Content protection services deal with the ability of users to control access to documents, limiting the time customers can have the documents on their systems and controlling whether they can download or copy them.

Identix will partner with leading certificate authority vendors to offer validation services for things such as digital signatures, Scullion said. The company will also license its technologies to other wireless providers for use on their handsets and networks.

Identix's move is representative of the growing vendor interest in the biometric authentication market, Keffler said. Microsoft Corp., for instance, recently announced plans to develop such software technology in partnership with I/O Software Inc., while big-name vendors such as Seimens AG and Sony Corp. are rushing to market with fingerprint scanners that can be embedded into handhelds, he said. ◗

Continued from page 1

Scanning

McLean, Va., will begin registering passengers at Charlotte/Douglas International Airport in North Carolina and Flughafen Frankfurt Airport in Germany today. EyeTicket has been scanning Charlotte/Douglas airport employees and U.S. Airways Group Inc. flight staffs since May.

The airport rollouts are among the first major business applications involving iris-scan technology. Until now, Bank United Corp. in Houston had been engaged in the most notable business application of iris scans, observers said.

In May last year, the bank converted three supermarket automated teller machines, at a cost of $5,000 each, to use the technology to identify customers before they conducted transactions. Bank United remains the lone player in its industry to go live with the technology, said Judy Wong, an analyst at Newton, Mass.-based Meridien Research Inc.

The technology got its start in law enforcement. In 1996, Lancaster County Prison in Pennsylvania became the first correctional facility to use iris scanning. Warden Vincent A. Guarini said the facility sometimes needs to release prisoners on short notice and can't wait for fingerprint tests.

Charlotte/Douglas aviation director Jerry Orr said his facility agreed to test the iris scans, which translate the 266 independent characteristics of the iris into a 512-byte digital code, for security purposes. Orr said reports from airport workers and flight crews have been positive. A 30 frame/sec., black-and-white video camera is used to take a picture of the eye from 6 to 36 inches away. EyeTicket Chairman and CEO Stewart Mann said iris scans aren't invasive like retina scans, which use a laser to probe the eye. He also said retinas change during a person's life, whereas irises don't.

Once U.S. Airways passengers enroll, their codes will be stored for future use. Mann said he hopes airline passengers will be able to step in front of a terminal kiosk, get scanned in one second and then be issued a boarding pass — a process he expects to bring online within a year.

AN AIRPORT IN North Carolina and one in Frankfurt have begun using iris-scanning technology

Supporters of the scans say the technology provides a way to identify people through a unique feature, since no two irises are the same.

Kevin Mitchell, chairman of the Business Travel Coalition, which lobbies airlines and others on issues that affect business travelers, sees iris scans as a convenience, not an intrusion.

"If you don't feel violated in an airport today by all the questions and the searches, this isn't going to make you feel more violated," he said.

He said he thinks passengers will be willing to test the programs for additional frequent-flier miles or other perks.

Orr said the iris scans have other advantages. "Obviously, your eye's pretty secure," he said. "You always have it with you. You don't have to worry if you left it somewhere or if someone else is using it when they shouldn't."

Wong said she believes that biometric technologies will be adopted slowly. "It's a lot of work to convert all those machines," she said. ◗

Continued from page 1

Licensing

ware license in the next few years. During the past few years, several vendors including Oracle have introduced licenses that are limited in time, and Microsoft joined that group on Friday by offering application service providers monthly pricing options for all its software.

Software licensing is changing in other ways, too, with per-processor licensing on the rise and many new pricing models emerging.

"What vendors are looking for is more predictable license revenue," said Marie Reeve, an analyst at Stamford, Conn.-based Gartner Group Inc. "A lot of users skip versions [of Office]. Microsoft is not seeing revenue from those customers in that period of time."

Subscriptions offer some benefits for users. Gregor Bailar, executive vice president and CIO at Washington-based Nasdaq Stock Market Inc., said the model may ease administration. "My whole philosophy is, I want to be counting belly buttons," he said. "Measuring how many people are using what and when is just not productive for us."

Rick Nolle, vice president of systems at Reinsurance Group of America Inc. in Chesterfield, Mo., said he hopes that a self-updating version of Office will ease upgrade hassles. "I'd love for my Office users to receive automatic upgrades from Microsoft and have self-maintaining systems," said Nolle.

But some CIOs and analysts see a trade-off: cost.

Gartner estimates subscription models cost corporations more in the long run. For instance, Oracle's new term licenses cost more than the old perpetual licenses after about five years, said Reeve. An Oracle executive said his company is simply providing more choices and will offer perpetual licenses, if preferred.

Microsoft's move from concurrent licensing to per-seat licensing has rankled users. Concurrent licensing counts the number of users that access an application at the same time; per-seat licensing is per named user. When Global Marine Inc. in Houston moved to Office 2000, it was forced to accept per-seat pricing, said CIO Dick Hudson. Microsoft was "able to raise a couple hundred thousand [dollars more] from us," he said.

Another option is a capacity-based model, such as per-processor pricing, which is used mainly for Internet applications. Per-processor licensing resembles traditional mainframe licensing schemes. Although it can ease administration, the software becomes more expensive when it's moved to a bigger machine.

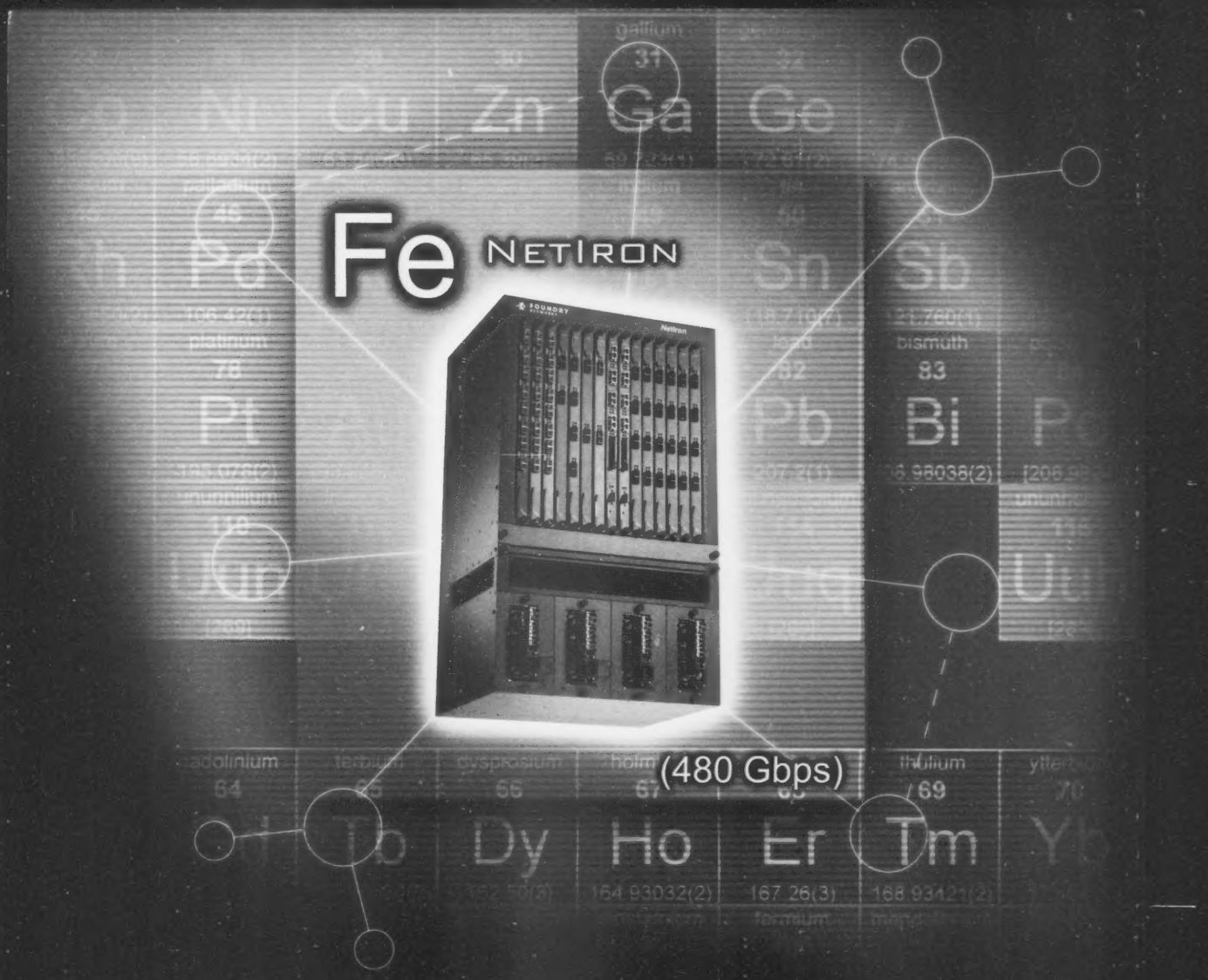
Yet the new choices do offer an opportunity to simplify software management and possibly save money.

"Negotiating skills are crucial," said Bob Schwartz, vice president and CIO at Matsushita Electric Corporation of America in Secaucus, N.J. ◗

More Confusion?

Corporations face an increasing number of licensing options such as:

- **Per-seat licensing:** Increasingly replacing concurrent user licensing
- **Capacity-based licensing:** Microsoft is implementing it; Oracle already uses it
- **Rental, subscription or term licenses:** Analysts say this method will prevail
- **Pay-per-use:** Popular with some ASPs; offered by ERP vendors like SAP
- **Business metric pricing:** Used by SAP in vertical markets



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FOUNDRY NETWORKS

Microsoft Still Sketchy on Details for .Net Tool Set

Analyst: Middleware-layer concept aimed at thwarting Java jumpers

BY LEE COPELAND AND DOMINIQUE DECKMYN
ORLANDO

AT ITS Professional Developers Conference last week, Microsoft Corp. unveiled a bit more of Microsoft.Net, the company's upcoming platform for developers to create Web services. Yet with final delivery still at least two years away, crucial pieces of the .Net puzzle are still missing.

The Microsoft.Net concept — a middleware layer that lets Windows applications share Web services with software built in other languages and operating systems — was introduced late last month. But there was scant detail on it until last week's conference, where preview versions of the Visual Studio.Net programming tool set, two newly proposed specifications and the 64-bit Windows 2000 were demonstrated.

The massive overhaul of Microsoft's tool set is aimed at keeping its developers from straying to the popular Java programming language, analysts said.

"Microsoft has essentially announced the obsolescence of its entire product suite," said Rob Enderle, an analyst at Giga Information Group Inc. in Cambridge, Mass. "It's a major [product] shift. Microsoft is trying to keep its developers from leaving and going to other technologies."

Enderle added that Microsoft is one of the few companies that could execute such an extensive product overhaul but cautioned that it would take Microsoft a minimum of two years to get a comprehensive set of tools into developers' hands.

The Visual Studio.Net tool set includes C#, which is a new language for developing Web services, and revamped Visual Basic, Visual C++, Active Server Pages+ and Visual FoxPro tools.

Still missing is the Common Language Runtime for C# (pronounced "C-sharp") and the universal compiler, which will translate code written in languages like Cobol and Perl to an intermediate language.

More Internet Products

The new Active Server Pages, ASP+, will have the ability to compile server-side components. When used with Internet Explorer 5.5 — also released at the show — ASP+ Web pages can send a "client control" down to the browser, giving a Web page Windows-like graphical user interface features.

Microsoft also gave developers preliminary versions of SOAP Contract Language and SOAP Discovery, two newly proposed software development specifications that are integral to the Internet-based .Net Web services strategy. The specifications are based on Microsoft's Simple Object Access Protocol (SOAP), which has been submitted to the World Wide Web Consortium for review.

"Microsoft realizes that this is a significant change and that it will be a culture shock to developers," said Mark Driver, an analyst at Gartner Group Inc. in Stamford, Conn. "Visual Basic deployment is on 32-bit Windows. And they reached the glass ceiling on how far they could go with it."

Microsoft Chairman and Chief Software Architect Bill Gates announced a preview release of 64-bit Windows 2000 and said next year's Whistler release of Windows will include some of the .Net technology, including the ability to save files to a Microsoft-hosted storage service. He said the Blackcomb version of Windows, due in 2002 or later, will be the first to feature the .Net User Experience. ◗

AT A GLANCE

Coming Attractions

Developers at Microsoft's DevCon saw previews of new tools:

Visual Studio.Net Preview released; final version due next year

Active Server Pages+ Expanded with user interface components that execute locally in Internet Explorer 5.5

64-bit Windows 2000 Preview released; final version due when Intel's Itanium chip ships

SOAP Contract Language and **SOAP Discovery** Two preview versions of specs that complement SOAP published

Continued from page 1

Microsoft.Net

of tools and infrastructure.

"One of my biggest worries is, do I really want to go with the .Net strategy? Because I think I will be sacrificing some cross-platform compatibility," said Tom Thornton, an information technology manager at MIT. "They are calling the network the Web, but I see a lot of network capabilities being sacrificed. I can't talk to other servers, for instance."

The .Net framework promises to transform Windows-based applications into Web sites that share services with applications written in other languages and for other operating systems.

Microsoft.Net will require a 64-bit Windows operating system foundation, revamped tools, a host of XML-based standards and the patience of developers.

Microsoft has just begun to upgrade its Visual Basic tools from a 32-bit environment to 64 bits and to push for the adoption of the new C# (pronounced "C sharp") programming language. Microsoft officials readily acknowledge that it will take at least two years to execute the tools and operating system overhaul.

"Its going to take a year before any of this can even begin to be implemented, and it's not going to be as easy as they're saying," said Rusty Zarse, a Web developer at HPC Interactive Inc. in Atlanta. "It's still a great evolution in technology, but it's not going to be a quick process."

Proof's in the Pudding

"The concept is good, but if it actually works, that would be fantastic," said Jeremy Smith, a software developer at American General Corp. in Houston. "Microsoft always says a lot of good things, but whether it actually comes true remains to be seen."

Other developers shared that skepticism.

"It's not clear where Windows is going at this point. It looks like they are totally switching, and it seems like there is a lot of confusion going on within Microsoft," said Sil Zendejas, a software developer at the Jet Propulsion Laboratory (JPL) in Pasadena, Calif.

What struck the loudest chord with developers here was Microsoft's pledge to make C# a standard and to support outside languages through its Microsoft Intermediate Language and Common Language Runtime (CLR), a universal engine for running different languages.

In theory, by using CLR and an internal compiler to generate Microsoft Intermediate Language, developers could write applications in Pascal or Fortran that would run in the .Net environment. Microsoft officials said 17 third-party programming language development companies have agreed to support .Net.

Zendejas said CLR could help the JPL better utilize the talents of Fortran and Cobol developers.

"I've tried C#, and it's still shaky, and [it will be] a while before it's ready," he said. "But at least they have something to give us so we won't abandon the platform and go to Java."

"Compiling to an [intermediate language] has been attempted in the past, but it's complex," said Jim Rutherford, a senior research analyst at Southwest Research Institute, a maker of navigational systems in San Antonio. "We'll have to see how well it does the job. We do high-performance work, so whether or not it will be applicable to us is something that we'll have to see." ◗

Hosted Services Concern Developers

Corporate developers at Microsoft's Professional Developers Conference last week said they're looking forward to getting applications up and running faster by using hosted Web services, but they're concerned about security and the effect on network responsiveness.

Tim Oliver, a senior systems analyst at General Electric Co., said during a panel discussion that it may not be wise to use hosted Web services for vital business functions. And panelist Buck Buchannon, a senior programmer at the U.S. Department of the Treasury, said security is his biggest concern about the Web services concept.

Others said it remains unclear how their companies' network use would change if corporate applications make calls to computing services that reside on the Web. How predictable overall system performance would be is another issue to watch, they added.

Web services are a key piece of Microsoft's .Net plan, which allows for the creation of software components that can be used by companies as building blocks for developing new applications or expanding the functionality of existing ones. The components will be able to run locally on corporate systems or at application service providers. Microsoft will also host some Web services itself, including the Passport identity service. – *Dominique Deckmyn*

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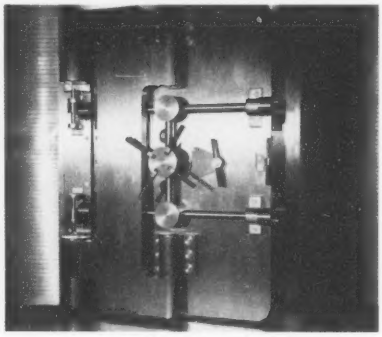

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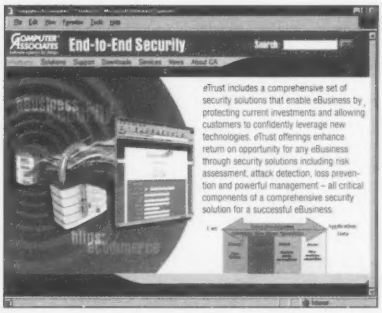

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IT Departments Frazzled At Cash-Short Dot-Coms

Frantic pace, tight budgets, staff exits lead to mistakes, neglect of IT basics

BY KIM S. NASH

As more and more dot-coms fall on hard times, insiders and ex-employees say the IT groups at those firms are frazzled — running short on cash, time and skilled staff.

Millions are spent on advertising instead of operations. The hours are long, but the time to make information technology decisions is short. The chaos leads to mistakes. And staff shortages only get worse when IT employees leave as financial trouble arrives.

To understand life at a struggling dot-com, listen to John Puckett, former CIO at now-defunct Toysmart.com Inc.: "You're standing at the top of a cliff, looking at the rocks below. You can make any [technology] decision you want very quickly — and the impact of it is the company's future. That creates a very interesting feeling in your stomach."

A stingy corporate parent doesn't help. Toysmart in Waltham, Mass., went belly-up last month when majority investor The Walt Disney Co. decided to stop funding the company [News, June 26]. But for several months, Burbank, Calif.-based Disney had been reluctant to give Toysmart's IT department the money necessary to, among other things, hire the 15 or 20 additional people it needed, Puckett said.

Drkoop.com Inc., a health information Web site that has been losing money, has seen its IT people quit because of the company's financial problems, which also make it hard to recruit newcomers, according to Lou Scalpati, a Drkoop co-founder and chief development officer.

The company, trying to conserve operating funds, has laid off 35% of its staff since the spring, though Scalpati said no full-time IT workers were let go.

The cash crunch at Austin, Texas-based Drkoop also means that plans for a backup data facility outside of Austin have been put on hold, Scalpati said. Drkoop's in-house data center and its outsourced backup center are both in Austin, but that's a big risk if a natural disaster strikes the area.

Disasters Waiting to Happen

Some dot-coms don't even have proper disaster-recovery plans in place, according to U.S. Securities and Exchange Commission (SEC) documents.

One is Pets.com Inc., an online retailer of pet products in San Francisco. "We do not currently have fully redundant systems or a formal disaster-recovery plan and do not carry sufficient business interruption insurance to compensate for losses that may occur," Pets.com told the SEC in May.

The risk is more than theoretical. During a six-week period in February and March, the Pets.com Web site was unexpectedly down 10 times, once for 13 hours. Customers either couldn't access the site at all or couldn't place orders, Pets.com told the SEC.

Pets.com declined several requests for interviews; the SEC filings didn't explain what caused the unplanned outages.

"Data has to be their most valuable asset. Not to protect it seems unbelievable," said John Heath, a professor of computer science at the University of Southern Maine in Portland.

Sometimes a dot-com survives a technical glitch only through the heroic efforts of its IT staff.

Despite several server crashes one weekend last summer, Drkoop users never saw the site go down, said Robert Eric Pearse, the company's former systems configuration manager.

On a Friday night, memory problems kept bringing down the Microsoft Corp. Internet Information Server software. Roughly eight members of the IT staff had to cut short their evenings out to fix the situation, said Pearse, who is now at CarOrder.com Inc., an online car-buying site in Austin, Texas.

While Drkoop developers paged through user logs, "We had two folks at hosting facilities rebooting the servers when they crashed," Pearse explained. "It was tense."

They finally traced the problem to a new server-side script that had overloaded the server software. The script's author should have reconfigured the servers to handle the new code load, Pearse said.

"At least once a month, there's a problem like that" at Internet companies, said Pearse, who has worked at six Net firms in three years. "You're dealing with new technology and you're trying to do it faster than your competition and you just forget stuff."

Yet he insisted that Drkoop "all in all [has] done a great job of system uptime."

> You can make any [technology] decision you want very quickly — and the impact of it is the company's future.
>
> JOHN PUCKETT, FORMER CIO AT TOYSMART.COM

Overlooking the Obvious

Inevitably, the chaos leads to carelessness.

During a recent server upgrade at the offices of a major online shopping mall, for example, a young network engineer made the rookiest of rookie mistakes.

As the staff tuned a new Sun Microsystems Inc. Enterprise 10000 server, no one paid much attention to a thick cable lying across the threshold of the glass room, according to the company's former chief technology officer.

"I was thinking, 'That couldn't be the network connection to the server, because no one would be stupid enough to put it in the doorway,' " recalled the 37-year-old former CTO.

Two days later — it had to happen — someone tripped on the cord and knocked out the server, albeit for just a few minutes. The company's database went down, causing errors for online users doing searches or updating shopping carts at the time.

"The guy who set it up had been reassigned to another facility. Everyone thought it was just a test cable and not the live connection," the ex-CTO said. "This is what frenzied IT will get you."

The relentless pressure at dot-coms can unsettle IT people used to methodical decision-making, said Gordon Jones, CIO at Beyond.com Corp., an online computer store in Santa Clara, Calif.

"If you want more reliability, you have to minimize changes. But if you minimize changes, then you don't get more functionality," Jones said. "It's not the ideal environment to make long-term decisions."

Plus, every blip of Web site performance can be tracked, traced, reported and dissected — so IT managers are accountable 24 hours per day.

Beyond.com lost $45 million for the first quarter of this year, while its stock is at $1.50 — down from a high of $30.

Jones has been at Beyond.com for 14 months and oversees a staff of 80. He was CIO at Franklin Resources Inc. in San Mateo, Calif., an old-line financial giant (with $222 billion in assets), where he oversaw a staff of 800.

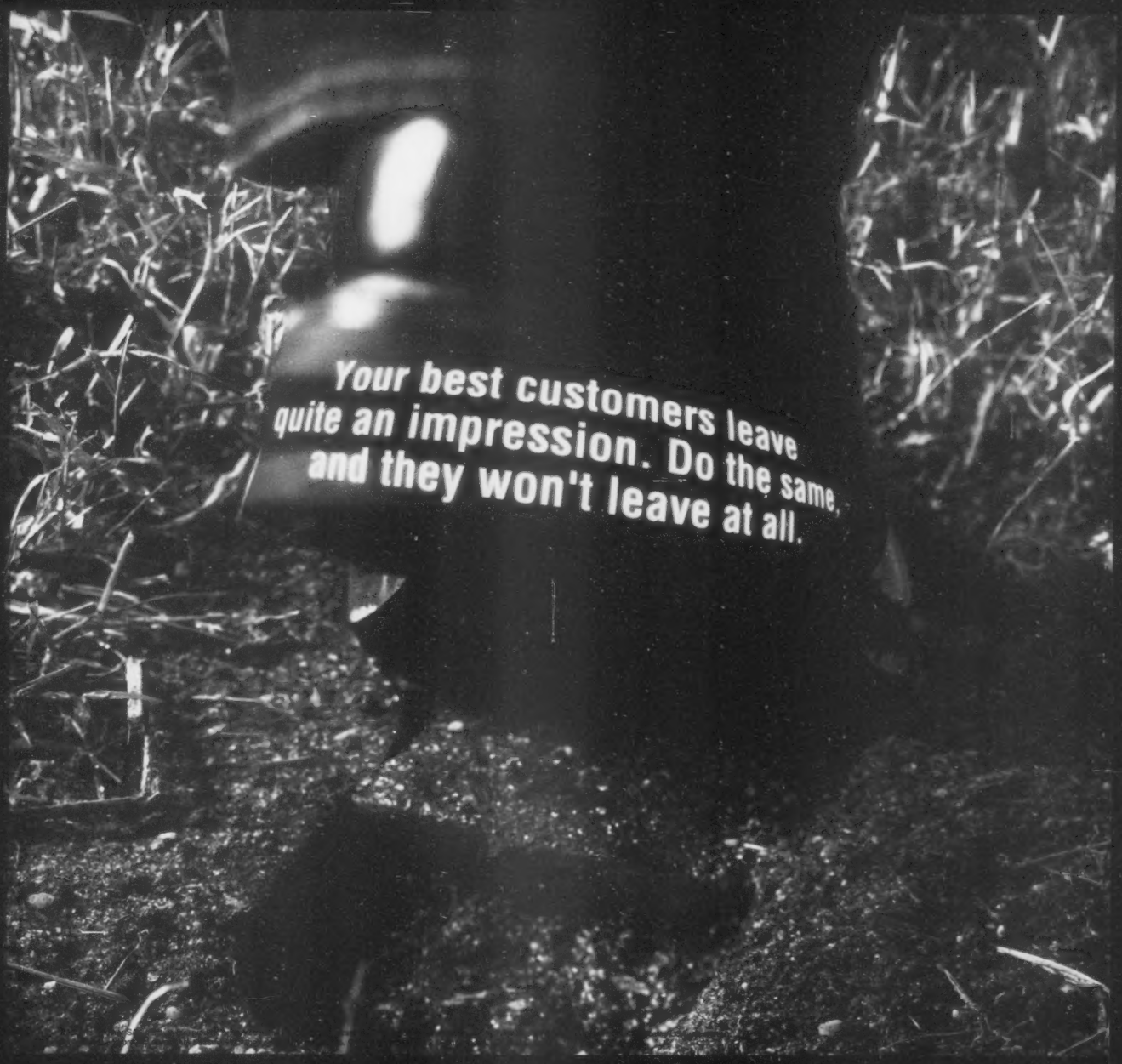
At Beyond.com, he's still a key senior executive. But now he carries a beeper that flashes hourly statistics on how the Beyond.com Web site is running, and he has to report to business managers every Monday on site performance. "There's quite a bit of pressure," he said.

The intensity can wear down even the most enthusiastic IT people. Toysmart's Puckett, who is in his early 50s, said he has gotten "hundreds" of calls and e-mail messages with leads on new jobs but isn't sure he'll stick with the Internet life.

Puckett's wife, Helen, said she doesn't care if he goes to a traditional company or another Internet venture "as long as the hours are better."

PETER ARNOLD/MADD

GORDON JONES, CIO at Beyond.com, says "there's quite a bit of pressure" to keep up site performance



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U.S./Europe Privacy Deal Sent Back for More Talks

European Parliament rejects proposal; safe harbor agreement in question

BY JENNIFER DiSABATINO AND CRAIG STEDMAN

ONE MONTH after the 15 member nations of the European Union approved a proposed set of data privacy rules for U.S. companies that do business in those countries, the European Parliament has voted to send the so-called safe harbor agreement back to the negotiating table.

By a 279-259 vote with 22 abstentions, the parliament earlier this month adopted a resolution criticizing the proposed privacy protections and demanding more changes in the safe harbor agreement, which has been in process for nearly two years.

According to a report posted on the parliament's Web site, the resolution directs the European Commission to add such items as a means for consumers to file privacy-related complaints to an independent body and a requirement that companies compensate people for any damage resulting from violations of the privacy rules.

Business as Usual

The safe harbor agreement is supposed to allow U.S. companies that promise to adhere to its provisions to continue e-commerce transactions with European customers and download employee information from corporate databases maintained in Europe.

But the U.S. Department of Commerce, which negotiated the agreement with European officials following the passage of stringent privacy regulations by the countries in that region, said it isn't certain how this month's vote will affect the safe harbor process.

"We still think the [agreement] is the most effective vehicle for bridging our different approaches to privacy," a Commerce Department spokesman said. But it's "unclear what the [European Commission] will do now," he added.

David Aaron, an attorney at Washington law firm Dorsey & Whitney LLP, who helped negotiate the safe harbor deal while serving as undersecretary of commerce, said U.S. officials are unlikely to agree to at least two of the European Parliament's requested changes. For example, the resolution approved by the parliament calls on the European Commission to pen contracts that European citizens could invoke in U.S. courts as part of lawsuits for alleged privacy violations. Allowing this "would require a complete change in U.S. jurisprudence, and we're not going to go for that," Aaron said.

Some European Parliament members also want to see the safe harbor system up and running before they approve it, Aaron added. But that would require U.S. companies to "make millions of dollars in investments" to implement the privacy provisions without knowing whether they would be able to use them, he said.

The Computer & Communications Industry Association (CCIA), a Washington-based trade association, also criticized the parliament's action. The vote "can do very little to promote Internet usage, investment and the development of e-commerce initiatives in Europe," said CCIA President Ed Black in a statement released earlier this month.

The parliament, according to its report on the vote, approved the resolution over the strong objections of European Commission member Frits Bolkestein, who was said to have "categorically excluded [the idea of] going back to the negotiating table with the U.S." during a debate on the issue.

Bolkestein denied that the European Commission had exceeded its powers in declaring the safe harbor provisions adequate, as the parliament's resolution claims. And he said the negative vote on the agreement would put the commission "in a very difficult position," given the lengthy negotiations with U.S. officials.

Aaron said he agrees. "I don't think the ball is in our court. If the Europeans think that they can put on an information embargo that will bring us to our knees, that's not the case. [The European Commission has] as much to lose as we do."

Washington bureau chief Mitch Betts contributed to this article.

Demand for Hosting Services Trails Supply

Competition heats up in search of users

BY MARK HALL

With hosting capacity at application service providers (ASP) growing by leaps and bounds, the service providers must be creative to attract new users to their data centers. Yet despite ample supply of capacity, ASP pricing appears to be holding firm for now.

Last week, Intel Online Services Inc. (IOS), a wholly owned subsidiary of semiconductor giant Intel Corp., introduced its AppChoice program to entice customers to its five new data centers. The company's parent has committed to spend $1 billion on data center infrastructure, an investment that could more than triple by the end of next year.

AppChoice constitutes a change in IOS's business strategy, which was to host high-margin custom applications for big customers. The new package allows IOS customers to remotely manage their own programs, cutting IOS out of that part of the business.

"Today, it's a little hard to choose your customers," said David Rowe, IOS director. He acknowledged that current customers use nearly 25% of the capacity at one IOS data center for simple co-location, a business that wasn't part of the original IOS strategy.

Less than two months ago, Exodus Communications Inc. in Santa Clara, Calif., announced an expansion of its target customers with a menu of managed service plans, changing focus from its traditional lower-overhead co-location users. The company operates more than 1.5 million square feet of data center real estate, and it plans to expand to 4 million square feet by the end of the year.

Filling these and other data centers with paying customers is the big challenge service providers face, observers say.

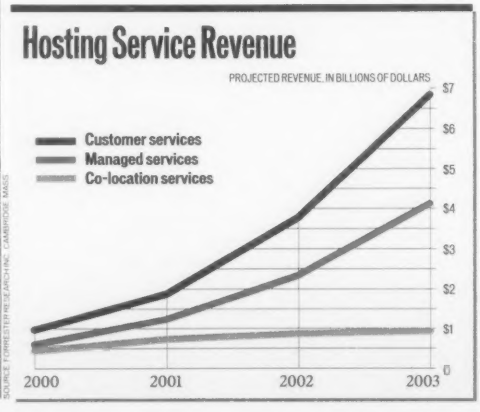
One ASP, Agiliti Inc., which had built its own data center, has shifted its strategy because of the abundant capacity. According to Feisal Mosleh, vice president of marketing and product management at the Plymouth, Minn.-based company, Agiliti is handling its growth by renting available space from other data centers because pricing has improved.

"Building a data center is like adding another sugar refinery, which the world does not need. However, you can never have too much chocolate. And that's what we sell," he said.

"Supply overwhelms demand," said Bill Martorelli, an analyst at Hurwitz Group Inc. in Framingham, Mass. But he said he doesn't think users will be able to leverage that into cost savings. "I don't think IT execs should try to squeeze every last dime out of an ASP."

Carlos Mendez started using Intel's AppChoice as a beta user in the spring, when he was vice president of Internet services at CommerceRoute Inc. in Emeryville, Calif. Now vice president of business development, Mendez said he chose IOS because his company's online digital market operations needed to scale rapidly. But he said IOS could have been more competitive in its pricing. "They need to be more flexible. Not just in services, but in getting the business," he said.

Although IOS didn't negotiate on price with CommerceRoute, Mendez said continued investment in data center capacity and competitive services means that "it's going to change."



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Firms Opt for Long-Term Outsourcing Deals

BY JULEKHA DASH

London-based aerospace firm Rolls-Royce PLC earlier this month inked a 12-year, $2.1 billion outsourcing agreement with Electronic Data Systems Corp. Analysts said such large deals reflect an interest among customers to keep technology costs stable over time. But given the rapid changes in technology, the strategy could prove to be risky, they said.

Plano, Texas-based EDS will develop e-commerce initiatives for Rolls-Royce, including the creation of Internet portals to customers and suppliers, said John Meyer, president of EDS Europe, Middle East & Africa. These portals will enable customers to locate spare parts and check inventory, while suppliers can collaborate online, he said.

EDS will also install, host and maintain SAP AG's R/3 enterprise resource planning software for Rolls-Royce. The agreement replaces a contract that was to expire in 2002 and covers EDS's support of the firm's applications and network infrastructure.

Analysts said customers who sign such hefty contracts want to secure a favorable price over the long run. "Consulting rates are only going to go up," said Joshua Randall, an analyst at Kennedy Information Research Group in Fitzwilliam, N.H.

Potential Problems

But these customers also face some risks, analysts said. As technology changes, leading vendors may not remain the top players in 12 years, said Julie Giera, a vice president at Giga Information Group Inc. in Cambridge, Mass. Giera noted that the large value of Rolls-Royce's contract stems from the fact that it covers 12 years.

ENGINE MAKER Rolls-Royce's 12-year deal with EDS is seen by some analysts as risky

Martin Brodie, a Rolls-Royce spokesman, said the scope of the contract with EDS reflects the aerospace industry's long business cycles.

The deal shows that EDS is alleviating market concerns about the firm's ability to bring e-commerce into its traditional outsourcing portfolio, Giera said (Week in Stocks, June 26). It also represents EDS's success in the manufacturing sector, an industry that has traditionally turned to outsourcing, Randall said.

EDS earlier this month also signed a seven-year, $700 million deal with Commonwealth Bank of Australia in Sydney. EDS will manage the bank's technology integration following its merger last month with Colonial Ltd. in Melbourne, Australia.

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BRIEFS

SCO Expects Larger Loss, Seeks Partner

The Santa Cruz Operation Inc. (SCO) last week warned that its financial results will be worse than expected or the second straight quarter. And the struggling Santa Cruz, Calif.-based company said it has hired an investment banking firm to help evaluate its financial options.

Doug Michels, SCO's president and CEO, said in a statement that the Unix and Linux software vendor is looking at the possibility of a "strategic combination" with one or more vendors.

SCO was expected to lose money in its third quarter ended June 30. But the company said the loss will be at least 50 cents per share, more than three times the average deficit forecast by Wall Street analysts.

Satellite Venture Finds Investors

Microsoft Corp. Chairman Bill Gates and several international investors last week announced that they have invested almost $300 million in ICO-Teledesic Global Ltd., a company that says it plans to become a global provider of wireless "Internet-in-the-sky" satellite communications services, including telephone service, Internet access and broadband services. The investments are part of the $2.1 billion that ICO-Teledesic – headed by wireless mogul Craig McCaw – needs to launch its services.

ICO plans to begin offering its wireless Internet services and other packet-data services in 2003; the Teledesic unit plans to begin delivering broadband data to mobile phones in 2004.

Short Takes

YAHOO INC. last week reported stronger-than-expected financial results for its second fiscal quarter as well as a sharp increase in traffic to its Internet sites. . . . IBM announced that it has acquired ARAGON CONSULTING GROUP, a market research and strategy firm in St. Louis. . . . PMC-SIERRA INC., a maker of communications chips, is buying QUANTUM EFFECT DEVICES INC. in a stock deal valued at about $2.3 billion.

Troubled StorageTek Replaces 'Lame Duck'

Users, analysts mixed about how much impact new 'outside' CEO will have

BY MEGHAN HOLOHAN

FIVE MONTHS after its previous CEO submitted his resignation, struggling storage systems vendor Storage Technology Corp. has appointed a new leader.

The Louisville, Colo.-based company announced last week that Patrick J. Martin, former head of Xerox Corp.'s $8 billion North American Solutions Group, is its new chairman, president and CEO.

But analysts and users are mixed about the impact that Martin, who has a strong marketing background, will have on the troubled company.

"He certainly has international background and the experience to run a good-sized firm," said Bob Zimmerman, an analyst at Giga Information Group Inc. in Cambridge, Mass.

Zimmerman acknowledged that he knows little about the new CEO but he said there is potential for Martin to help the company become profitable.

But other analysts said they remain skeptical.

"They came up with someone who's not only outside [StorageTek] but also outside of the industry. They went outside of the industry before [for a CEO], and I'm not sure that it helped them very much," said John Webster, an analyst at Nashua, N.H.-based Illuminata Inc.

StorageTek needs a leader who can boost morale and focus on operational excellence and product development, and the company thinks Martin will bring that capability to the table, Webster said.

But investors want profit. A new CEO doesn't translate into a positive business move without tangible financial benefits, said Shebly Seyrafi, enterprise hardware analyst at A. G. Edwards & Sons Inc. in St. Louis.

Seyrafi said he thinks investors had hoped for a leader with storage experience. But, he added, appointing a new CEO is a positive step, since StorageTek had been operating with a "lame duck" CEO since February, when Martin's predecessor, David E. Weiss, announced his resignation.

Earlier this year, StorageTek announced layoffs of 1,300 employees because it suffered higher-than-expected losses last year.

The company lost $39.5 million in the first quarter ended March 31, a significant decline from the first quarter of last year, when it saw a $5.8 million profit.

Seyrafi said StorageTek's tape division is strong, but disk is replacing tape in the storage arena, and Hopkinton, Mass.-based EMC Corp. is the leader in disk storage.

StorageTek's recent expansion into the storage-area network (SAN) market is wise, but the company is at a disadvantage in that space because it faces stronger contenders, Seyrafi said.

Users also said they're wary of the new CEO.

QUESTIONS SURROUND Patrick J. Martin, StorageTek's new CEO

"I think the market and most of the users will give him a couple of quarters to show his stuff," said Jerry Lynch, director of operations at Dublin, Ohio-based Online Computer Library Center Inc., which uses StorageTek's 9840 tape system. "Six months out, though, he'll pay hell if results surprise anyone."

Several users and analysts pointed out that StorageTek needs to focus on marketing, one of Martin's strengths.

Dr. Robert Cecil, director of network computing at the Cleveland Clinic in Ohio, also uses a 9840 tape system. He said Martin's appointment proves the company realized it has trouble with marketing strategies.

"StorageTek is a technology-driven company, and EMC has been eating its lunch marketing-wise," Cecil said. "A company may have superior products, but [that's] not why you buy the products. It's the labeling," he added.

Kathleen Ohlson contributed to this story.

J. D. Edwards Prepares Network for Major Upgrade

Firm adding new routers, NT servers

BY JAMES COPE

Officials at enterprise resource planning (ERP) software developer J. D. Edwards & Co. last week said the firm has undertaken a major upgrade of its corporate network to support its international expansion plans and its application hosting business.

J. D. Edwards' move is part of an evolutionary process rather than a one-time build-out, according to Ken Migaki, a vice president at the Denver-based company.

"We've got a base network and are now expanding to meet new business needs," he said.

KEN MIGAKI says the process is evolutionary

In addition to providing more network capacity to serve new office locations in Australia and New Zealand, J. D. Edwards is preparing its data pipes to handle traffic from its own application hosting service, called JDe.sourcing, which hosts J. D. Edwards' ERP applications via the Web.

Migaki said the upgrade involves a transition to Catalyst 6500 switches from Cisco Systems Inc. in San Jose and implementation of network management tools from Magnum Technologies Inc. in Eden Prairie, Minn.

J. D. Edwards is upgrading from Cisco 5509 switches to Cisco Catalyst 6500s.

The 6500s, Migaki said, have more routing intelligence, and migration is expected to be relatively seamless. Migaki said he's running the 6500s in a lab environment before putting them into production.

J. D. Edwards has also added 300 Windows NT servers from IBM. The new servers, which went online in mid-June, host the J. D. Edwards demonstration software. Previously, salespeople had to take a server into a customer's office to do a demonstration, Migaki said. Now they can log on remotely, which "minimizes prep time and shows a consistent demo," he said.

Migaki said he'll use Coordinator and Cap-Trend from Magnum Technologies, to streamline network management. The Web-based Coordinator application gives network managers a real-time view of network problems by connection.

According to Michael Jude, an analyst at Enterprise Management Associates in Boulder, Colo., Coordinator "prefilters alarms and avoids alarm storms from multiple devices."

Jude said Cap-Trend gives network managers a means of tracking network performance over time, enabling adjustments that counter bottlenecks.

MARK HALL

Pay now, pay later

PERHAPS THE ONLY THING you dread more than reviewing your data center's cabling and network infrastructure is evaluating your array of software-usage contracts. They can be far more confusing and frustrating than your most chaotic wiring closet.

MARK HALL is *Computerworld*'s West Coast editor. You can contact him at mark_hall@computerworld.com.

You can license software for servers or clients. You can rent it by the week, month or year. You can pay per user, processor or transaction or by business volume. You can try open source or community source. You can build it yourself from components and pay royalties or flat fees. And every once in a while, you can actually buy and own a program.

The choices for legally acquiring software are numerous. Some say too numerous. And it's getting worse — vendors continue to add options or change things for their own sake, as Dominique Deckmyn reports in this week's News section. It's as if software vendors have conspired to make the licensing process so awful that you'll think an application's bugs are pleasant by comparison.

One of the worst offenses is capacity-based pricing [page 4, July 10]. Users are telling *Computerworld* that their ability to deploy better-performing hardware is harmed because software vendors tie their pricing to machine capabilities. These capacity pricing schemes are primarily in the mainframe market, but database companies are beginning to push them in the server arena as well. This kind of price gouging handcuffs IT managers.

Some hardware vendors profess to hate these complex and greedy sales tactics, while others urge software vendors to steer clear of them because they slow shipments. Yet IBM, which may lose S/390 sales because of them, still sells some software with capacity pricing language in its contracts.

It isn't just capacity pricing that disturbs IT managers. In the server market, some vendors are revising their contracts to revoke ownership provisions. These nonpermanent licenses might prove to be a revenue boon for some vendors, but they often force unnecessary business changes, as well as technology changes, on companies.

Every IT executive I've ever spoken to about this says paying for software value isn't a problem. But software vendors don't seem to care about value. They seem focused on getting users to pay much more in every conceivable fashion for much less. That may be clever accounting, but it's bad business. ◗

News item: Digital signatures suffer from lack of standards

DON TAPSCOTT

Internet's reach even extends to 4 P's of marketing

EVERY BUSINESS SCHOOL graduate and marketing manager has learned the four P's of marketing: product, price, place and promotion. The paradigm was one of control, simple and unidirectional: Firms market to customers. We create products and define their features and benefits, set prices, select places to sell products and services and promote aggressively through advertising, public relations, direct mail and other in-your-face programs. We control the message.

DON TAPSCOTT is chairman of Digital 4Sight and co-author of *Digital Capital* (Harvard Business School Press). Contact him at dtapscott@digital4sight.com.

But the Internet transforms all these activities.

Products. Products are now mass-customized, service-intensive and infused with customers' input and individual tastes. Companies must constantly innovate, and product life cycles are shorter. Customers now participate in creating products, and products are becoming experiences. As a result, the old industrial approaches to product definition and product marketing are dying.

Price. Dynamic markets and pricing are challenging vendors' fixed pricing. Through the Web, customers can find ways that allow them to state what they're willing to pay and for what. "If you deliver this afternoon, I'll pay A. If I can buy this quantity, I'll pay B." Or "I'll accept certain defects and pay C. If someone else will pay D, then I'll pay E." As buyers and sellers exchange more information, pricing becomes fluid. So markets, not companies, will price products and services.

Place. Every company now competes in two worlds: a physical world (marketplace) and a digital world ("marketspace"). Within a decade, most products and services will be sold in the marketspace.

A new frontier of commerce is the "marketface," the interface between the marketplace and marketspace. For example, some companies have both physical stores and an online presence (clicks and bricks). Customers of The Gap can buy clothes online; if the clothes don't fit, they can return them to a physical store. Or they can browse the Web at their leisure and take printouts of desired items to the store. The Gap has even installed Web lounges in some stores where customers can place orders.

Promotion. Advertising, promotion, publicity, public relations and most other aspects of corporate communications are archaic concepts. They exploited one-directional, one-to-many and one-size-fits-all media to communicate "messages" to faceless, powerless customers.

But with the Net, customers have the power. They have access to more comprehensive information about products. Customers participate in a multidirectional, one-to-one and highly tailored communications environment. So they, not you, control the marketing mix. They choose the medium and the message. Rather than receiving broadcast images, they do the casting. With companies such as Epinions.com, customers create online public opinion with one another, rather than just getting messages from earnest PR professionals. Marketers are losing control.

The Net changes most aspects of marketing. When customers go online, everybody communicates — in multiple directions — and marketers can no longer control the four P's.

DON TENNANT

Star power has its advantages in world of IT

WHEN ORACLE CEO Larry Ellison was looking for somebody to head his latest "it's-not-a-PC" venture, the person who got the call was Gina Smith, a technology journalist with a high-profile, on-camera ABC News gig on her résumé. It was an interesting choice.

Maybe Ellison was moved by the vastness of an untapped resource. According to President Clinton's Council of Economic Advisors, women hold only 8% of the nation's top information technology jobs.

DON TENNANT is *Computerworld*'s assistant news editor. Contact him at don_tennant@computerworld.com.

More likely, Ellison was considering his own experience and recognizing that star power is what it takes to capture and hold the attention of the Internet Generation.

In either case, Smith has her work cut out for her. As CEO of The New Internet Computer Co., her first order of business is to ceremoniously roll her eyes every time someone suggests that the $199 New Internet Computer is the reincarnation of Ellison's first hard-diskless bad idea.

But in fact, nothing could be further from the truth.

I know, because Smith told me so recently during a phone chat. For one thing, unlike the original network computer, this computer doesn't even have to be connected to a server, since all the software it needs to get you onto the Internet (including a version of Linux that some Oracle techie tweaked to make Netscape Navigator run the way it's supposed to, Smith says) comes on a CD-ROM.

Plus, this one has a friendly sounding, pronounceable, marketable acronym (NIC — as in New Internet Computer) rather than the not-nearly-as-personable NC. (It struck me that the world might be a different place today if only Ellison had had the foresight back then to pronounce NC as "Nancy.")

So even though Smith had trashed the NC back in her journalism days, Ellison called her last fall and said he had something very important to talk to her about. Smith said she hadn't heard from Ellison in about three years and wasn't sure whether it was one of her columns or an appearance on *Oprah* that prompted the call.

When he hit her with the idea of running his new company, Smith said she "fell off the chair" but eventually agreed to do it. What he was looking for, she said, was somebody who could explain the NIC and get people excited about it. Never mind that Smith had virtually no management experience and had never done anything of the sort before.

To her credit, Smith makes no bones about the fact that she's nothing more than a figurehead. She said she hired the best manager she ever had — a guy named David Street, who was her boss at a hard-disk company she worked at right out of college in 1985 — and made him chief operating officer. (It sounds a little humiliating to me, but I doubt Dave had a better offer on the horizon.) So while he takes care of the pesky business of actually managing the company, Smith is free to make personal appearances and do the celebrity CEO thing, which Wall Street just loves.

Grabbing Smith was a brilliant move on Ellison's part. Aside from being smart and articulate, Smith has a great stage presence. Food for thought for some of those sluggish companies like Compaq, which, if it had any sense, would bump the pallid Michael Capellas down to chief operating officer and get Diane Sawyer on the phone. After all, when's the last time you saw Mike on *Oprah*?

READERS' LETTERS

Microsoft: Just trying to make a profit . . .

I AGREE WITH Michael Gartenberg that a breakup of Microsoft would, most probably, increase Microsoft's software prices and benefit only its competition ["Why a Breakup of Microsoft Is a Bad Idea," News Opinion, July 3].

Those who shout that Microsoft is a bad monopoly that needs to be broken up are only trying to gain something. Microsoft is a company trying to make a profit, and in that it has used business practices that aren't aboveboard; those practices should be changed.

Kevin Sanchez-Cherry
System security analyst
Rockville, Md.

. . . or monopoly that deserves breakup?

MICHAEL Gartenberg seems to gloss over a number of critical problems Microsoft created for itself in relation to the law and reflects too much time inhaling the many dizzying vapors of Microsoft PR.

I just wish there were a Microsoft like the one Mr. Gartenberg imagines. I wouldn't want to break that one up either. But that's not the Microsoft we have. The Microsoft we have is amoral and has earned its ire and judgment through years of disregard for the law and callous treatment of its "partners" and its despicable treatment of newly emerging companies and competition. The public suffers due to the shoddy and insecure works it receives, and it also suffers from having demonstrably few alternatives to these products, again due to the monopolistic control Microsoft has exerted on the companies involved with PC production and distribution. Breaking up may be hard to do, but it is due and just.

Steven Armstrong
Milwaukee

Quality cops count

"QUALITY COPS" [Technology, June 12] was an excellent story about a true professional who deserves the accolades.

Congratulations to Susan Burgess and kudos to *Computerworld* for recognizing a professional who is dedicated to improving the quality of our software processes and the resultant software product.

We need more people like Ms. Burgess — and the author who took the time to write an eloquent story about her.

Carol A. Dekkers
President
Quality Plus Technologies Inc.
Seminole, Fla.
dekkers@qualityplustech.com

Reasonable ways to avoid domain woes

IT SEEMS TO ME that the following would be a reasonable approach for registrars to handle domain name changes ["Domain Name Game," Technology, June 12]:

- Changes don't go into effect for at least five days, except in an emergency. Emergencies wouldn't be handled by the automated process and would require management approval by the registrar.
- When a change is submitted, e-mail is automatically sent to the person listed as the administrator of the Web site.
- Any report by a system administrator of a change he hasn't authorized is treated as an emergency.

Bradley Ross
Programmer
Philadelphia

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.

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Dear *Computerworld* Reader:

Growing at unfathomable speed, e-business has become a way of life for today's business leaders. It's making overnight successes of clicks-and-mortar enterprises and creating unprecedented new opportunities for bricks-and-mortar companies.

So it should come as no surprise that SAS, a name that's no doubt familiar to regular readers of our newspaper, is continuing its long history of innovation by embracing a true leadership role to move its customers ahead in the new e-conomy. You can see for yourself in this issue. Look for the colorful, informative insert called *The Power to Know*™. It's your introduction to SAS® e-Intelligence, and a bold reintroduction to SAS itself. I hope you'll take a few moments to discover how the power of SAS can help you:

- **Align your organization.**
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- **Capitalize on your customer relationships.**
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To explore e-Intelligence in greater depth, SAS invites you to take part in a series of free virtual seminars. Each online event will feature expert advice from analysts and leading organizations on using *The Power to Know*™ to gain maximum competitive advantage. To sign up for these live Webcasts visit www.sas.com/e-cast.

I've been impressed with all I've read — and seen — regarding e-Intelligence and the new face of SAS. I'm sure you will be, too.

Sincerely,

Joseph L. Levy
President, CEO and Publisher

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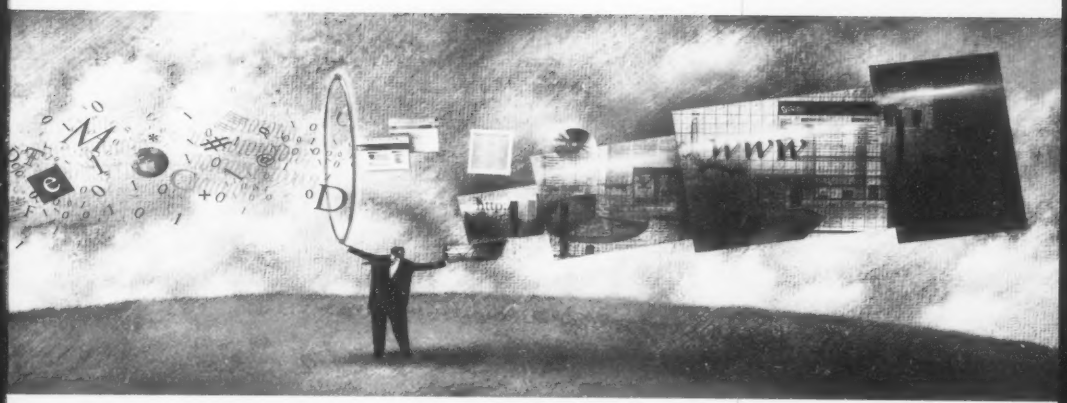
e-Intelligence



The Power to Know.

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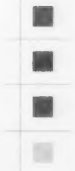
With a history of leadership spanning nearly a quarter century, SAS has been helping companies around the globe transform raw data into revelation. As the Web economy evolves, SAS continues to deliver superior solutions built to generate better decisions at every level of your organization, from your IT shop to the board room.



SAS® e-Intelligence.

Some companies gather data.

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With all the talk about the power of the Internet, what benefits have your customers seen from the flood of new technology? Has your organization kept pace with the rapid change in the global economy? Have your supplier relationships evolved with the rest of your business? SAS e-Intelligence enhances performance through knowledge. And delivers results through better business intelligence. So you can make decisions with greater confidence as you compete in the evolving global economy. Tapping the power to know is where it all begins.

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Performance. It's what propels the economy – and your organization – forward. But how do you align your strategy, operations and employees to achieve your goals? And measure progress toward them?

SAS gives you a panoramic understanding of the relationships and drivers of success across your enterprise. It's never been easier to communicate the impact of individual or group contributions toward achieving your shared vision. Or to keep specific areas of your business on track toward identified objectives. Know where your company stands and where you need to lead it.

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Your business competes in a market that is more crowded than ever and moves at a breathless pace. To claim your place in the market, you must claim your space in the minds of your customers. SAS lets you harness the information you gather from every interaction with your customers to create a more responsive, personalized and innovative offering. By organizing customer data in ways that make their needs and desires tangible, you can provide the products and services your customers demand, before they have to ask for them. Target your most profitable customers and turn them into your most loyal supporters.

The power to know your organization
The power to know your customers
The power to know your suppliers
An architecture that enables your organization

The power to know your suppliers.
In the Web economy, supplier relationships have evolved into crucial alliances. The speed and efficiency with which you deliver intelligent products to market depends on the suppliers you choose. SAS gives you insight into your supplier network like never before. With exclusive data from Dun & Bradstreet, you will gain the knowledge to turn your essential supplier relationships into more profitable ones. And ultimately, to deliver new products and services to market faster, at reduced cost. Know your suppliers better than they know themselves.

An architecture that enables your organization.
You have data. We give you power to use it in ways you never thought possible. Across platforms and across continents, SAS drives your data to work harder, smarter and more profitably.

And unlike other solutions on the market, only SAS can truly make the most of your existing infrastructure. Because the real marvels of software innovation are the ones that don't just reach your highly trained IT staff – they make it to every desktop. Achieve more with the data you already own and leverage it with new sources more intelligently.

Software and services that turn the chaos of data into the clarity you need to make better decisions. SAS® e-Intelligence empowers the leaders, the thinkers, the creators in your organization to take the ideas of today and create the innovations that will lead the marketplace of tomorrow.

Chip Perry
AutoTrader.com
President and CEO

Grant Felsing
Briggs & Stratton
Project Manager for Finance and Controlling

Our customers come to us first with a challenge.

They come back to say thank you.

AutoTrader.com

With more than 1.5 million listings, AutoTrader.com is reinventing the way people shop for used vehicles. The online auto dealer wanted to quickly build a strong foundation for collecting and analyzing customer data to better serve its exploding customer base.

AutoTrader.com selected SAS e-Intelligence to power its mission-critical Management Dashboard application. "The dashboard is the central nervous system of our business," explains Chip Perry, president and CEO of AutoTrader.com. "It allows company executives to daily monitor, improve and strengthen our business, as well as track and report program performance to our paying customers."

The result for AutoTrader.com has been the exponential growth of intelligent data and the ability to incorporate customer feedback directly into its offerings. Not only does the company have more data to work from, it now has the ability to manipulate it intelligently for specific business goals. By providing managers with custom reports of daily customer activity and shopping trends, SAS has enabled AutoTrader.com to break new ground in B2B and B2C commerce. The bottom line?

"Without question," says Perry, "SAS has given us the power to run our business effectively day by day."

Briggs & Stratton

Briggs & Stratton, the world's largest manufacturer of air-cooled gasoline engines, faced an information challenge. The company began data warehousing initiatives in 1988, "long before the disciplines were understood, defined, or even named," says Grant Felsing, project manager for finance and controlling. The company selected an ERP solution in 1998 and installed SAP AG's R/3 product.

"At the same time," explains Felsing, "our database analysts were telling us that the system was undergoing explosive growth, and we'd be out of disk space in four months."

The very data the company would need for analysis reporting was the data being targeted for removal. It quickly became obvious that Briggs & Stratton's reporting response was going to have to include a data warehouse solution deployed in parallel with the operational system.

"The success of SAS software in an ERP environment is simply that its strengths are in line with the need," says Felsing. Building the data warehouse with SAS software provides for the seamless addition of data stores not maintained within the SAP system.

"SAS software supports almost any data source," Felsing says, "and enables it to be combined with ERP data to produce a complete corporate picture. SAS resources are more accessible and available at more reasonable economics – so initiatives developed in SAS will cost substantially less. Leveraging that price differential with the speed with which SAS applications can be developed gives you a cost-effective solution for analysis reporting in an ERP environment."

UBS AG

Improving the retention and profitability of clients over the long term is a challenge that Swiss bank UBS AG is meeting with tremendous success. Adrian Weiss, executive director for private clients at UBS, and his team rely on SAS data mining solutions to satisfy customers by matching specific marketing initiatives with individual clients, based on customer profiles.

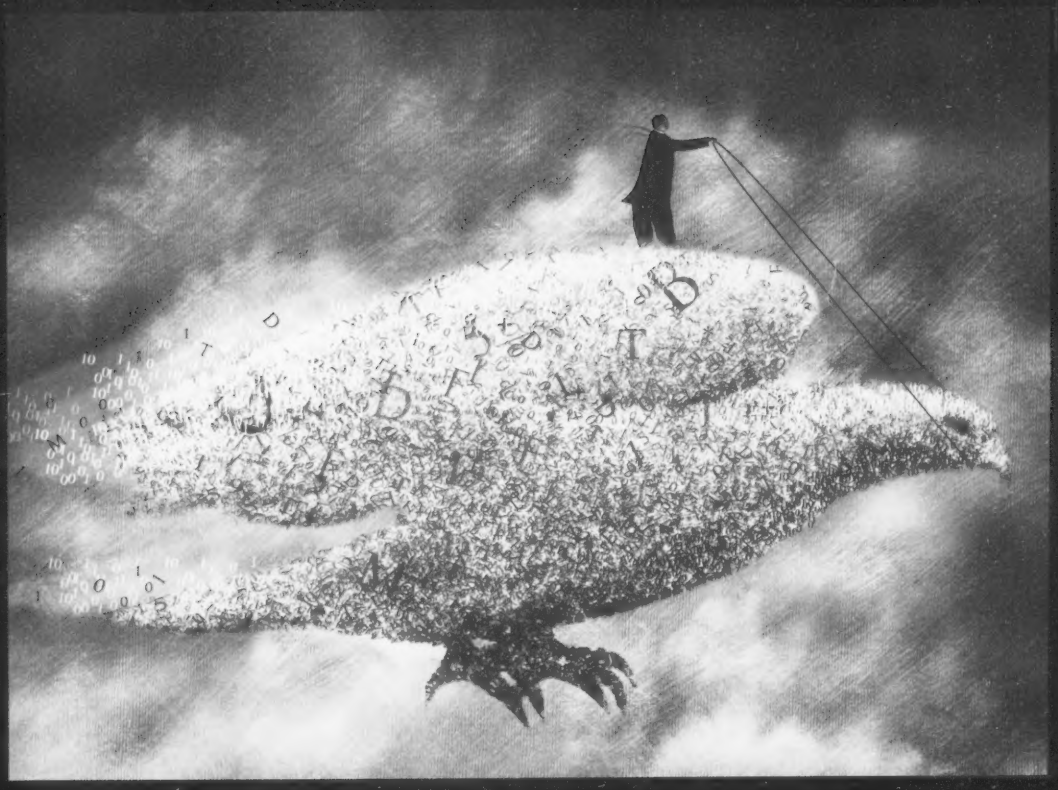
"A cornerstone of the business philosophy of UBS' Private Clients Department," says Weiss, "is to improve the profitability of our customer relationships by using information-based marketing."

Weiss and his team used SAS to convert huge volumes of raw data into meaningful information that formed the basis of this marketing strategy. Using these tangible marketing objectives, other departments in the bank target their approach to individual customers based on each customer's background and profile.

"We were able to deliver a good retention model in one month," says Weiss. The result has been improved client retention rates and greater success with new product offerings introduced through direct marketing initiatives. Weiss and his team have been pleased with the performance of SAS software as a cornerstone of their data mining operations.

"We have a data mining factory that is state of the art, and SAS software is an integral part of this," adds Weiss. "It's quick, reliable and stable, and it's proved to be flexible and scalable." And it continues to help UBS AG position itself as a leader in the European banking community.

Adrian Weiss
UBS AG
Executive Director for Private Clients



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JOHN GANTZ

How to win in the battle for IT talent

IF YOU DON'T THINK the hallmark of a well-run IT department is its ability to hire good people, take a tip from the major IT services firms like IBM, EDS and Andersen Consulting. These companies spend about half of their marketing budgets to support recruiting. Apparently they have less trouble finding projects than people to do the work.

JOHN GANTZ is a senior vice president at IDC in Framingham, Mass. Contact him at jgantz@idc.com.

Your company is probably in the same boat. With project deadlines getting squeezed and new e-business applications being driven by top management, your IT department's ability to hire good people is arguably *the* most important factor for long-term success.

One of the keys to good hiring in this frenetic market, it turns out, is keeping accurate statistics and metrics on the hiring process itself. This was confirmed last year in a survey conducted by International Data Corp. (IDC) and *Computerworld* of more than 70 recruiters of IT professionals. Keeping stats on the hiring process helps make it more orderly. After all, each hire isn't an emergency.

It all starts with knowing how long it takes to hire a person. Even a well-oiled recruiting machine will take almost two months from identifying a need to hire someone to receiving an accepted offer. And this implies that the company has a source of leads and a quick turnaround on interviewing. But having a clear understanding of the hiring time line helps managers throughout the company approach hiring in a systematic manner.

You must also know how many applicants you need in the pipeline to generate a hire. In the IDC/*Computerworld* survey, it took the average company 26 qualified résumés to yield three interviews before hiring someone. Your company may have different ratios, but you need to know what they are in order to meet your hiring plan.

But then, you must also know where your best hires have come from so you can go to the same source again. Did they come in over the transom? From employee referrals? Headhunters? Monster.com? The survey found that the most efficient channel for hiring — in terms of offers accepted per résumés gathered — was employee referral, followed by third-party search firms. The least efficient was the recruitment job fair. If you consider the costs of recruiting through each channel, then employee referral and college recruiting look pretty good.

These metrics will vary by company. But it's important to keep and use them to refine your process.

Look at it this way. Most companies have elaborate forecasting and tracking systems for keeping the sales pipelines full. They know lead times, visits or calls per sale and costs per sale. They segment their customers in different demographic and statistical groupings, and they pay for leads. They call lapsed customers and try to win them back. Why should recruiting be any different with people who rejected your job offers? Aren't you trying to sell your company to the best potential employees?

If you're a manager looking to hire IT professionals, your first action item is to find out if your HR people keep such statistics. If not, push them to do it, or do it yourself. Until you have a process and ways to measure its success, you can't hope to improve your recruiting record.

WILLIAM M. ULRICH

Don't forget business rules in Web migrations

THE REQUEST seemed simple enough. Marketing wanted customers to be able to order products through the Internet. This meant the company needed a Web-based application to check item availability, issue order requests, calculate prices and replicate a host of other functions that were being performed by legacy applications. In response to the request, the project team planned to use a tool to capture legacy business rules (blocks of conditional and imperative logic that change the state of business data) and import them into a Java-based front end. While this may seem like an easy answer to a simple request, this project could torpedo Internet deployment efforts if it ignores strategic implications.

WILLIAM M. ULRICH is a management consultant and president of Tactical Strategy Group Inc. Contact him through www.system transformation.com.

There is growing popularity for legacy business-rule reuse as companies move functions to the Web. But doing that on a large scale requires addressing a number of inherent complexities. Legacy rule identification can be difficult because of inconsistencies in legacy data definitions and the cryptic, redundant nature of the rules themselves. But uncoupling business rules from legacy systems is just one hurdle.

When legacy systems continue to run parallel with Internet applications, major synchronization problems can occur. For example, a legacy system may update customer data one way while an Internet application may do so another way. This could cause unexpected results or delays for customers. As more functions move to the Web, business-rule synchronization problems can spin out of control.

It takes a comprehensive, enterprisewide coordination strategy to ensure that business-rule capture, reuse and synchronization are managed effectively over the long term. And this requires answering a few questions. For example:

- What constitutes a business rule?
- How can you reconcile legacy data definition inconsistencies?
- Can multiple projects synchronize rule identification and reuse?
- How can you reconcile redundant processing results when rules ported to an Internet application continue to run on the mainframe?
- What cataloging scheme can be employed to track business rules as they are captured, consolidated and redeployed?
- How do you deactivate legacy rules that are no longer needed?

Any attempt to reuse legacy business rules as part of a Web-based deployment plan must be addressed in an overall strategy. This strategy must then be communicated to any project team involved in capturing and reusing business rules.

To begin, establish an oversight team to draft and deploy a legacy migration strategy. This includes creating a concise definition of a business rule and a process for identifying, classifying, consolidating and reusing rules. This process should define how data definitions are used to help identify rules and indicate how redundant rules and data can be grouped and consolidated across multiple stand-alone systems. Because there are software tools that support this process, the team should also identify a tool to enable rule identification, classification, consolidation and reuse.

There are two schools of thought regarding rule classification schemes. One says that a scheme should indicate the events triggering a rule within the legacy environment. This provides analysts with a basis of understanding for reapplying those rules in a Web-based environment. But business rule purists argue that a rule should stand alone and be classified based on the business data it impacts. Whatever scheme you choose should store rule definitions in a repository, indicate where they are used and allow analysts to access, add or update rules for ongoing Internet migration projects.

Forming a strategy to capture, classify and reuse business rules requires some front-end investment, but it yields long-term savings as more functions shift to the Internet. Ignoring the need for such a migration strategy means driving Internet deployment into a sea of chaos.

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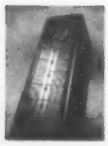

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BUSINESS

PACKAGED GOODS

With deregulation looming, utilities are choosing less-expensive packaged software rather than developing custom systems. After two years of trying to develop its own customer information system, BC Gas in Vancouver, British Columbia, chose a packaged application — at about 25% the cost of starting from scratch. ▸ 36

IN THE NAVY

At age 5, Joyce Allen-Kendrick dreamed of serving as a Marine Corps drill sergeant. Now, 30 years later, she's the executive officer and second in command at the U.S. Naval Telecommunications Station in Puget Sound, Wash. In an interview with *Computerworld*'s James Cope, Allen-Kendrick compares her role with that of a corporate CIO. ▸ 38

KNOW YOUR ASP'S ASP

Do you know everything about your application service provider? What about your ASP's ASP? As more service providers outsource parts of their operations, such as customer relationship management, possible points of failure increase, warn analysts. ▸ 39

BEATING OUT THE DOT-COMS

At Widener University, IT workers earn about 20% less than the region's median salary. But that hasn't stopped IT director Gary Habermann from luring top talent. The trick to competing with cash-rich and hip dot-coms, says Habermann, is to tout benefits like free tuition for employees and their families, flexible hours and the opportunity to play with cutting-edge high-tech "toys." ▸ 42

STAYING SECURE

Too often, security is viewed by corporate management as an extra hassle to deal with. The problem is that it's usually reactive. Experts say creating a dream security infrastructure isn't an easy task, but it's well worth the effort. Here's how it can be done. ▸ 44

WOOING IT EXECS

When Howard Schultz, founder of Starbucks, popped in on an interview with CIO candidate Ted Della Vecchia, it helped convince Della Vecchia to take the job. Some tips for landing high-level IT workers include involving top executives in interviews, offering stock options and touting leading-edge technology. ▸ 48

CLOSING THE GAP

As companies scramble to find qualified IT workers in today's tight job market, JobLink, a Bay area program, is helping to fill that pool of candidates by drawing more minorities and women into IT with free hands-on training, writes Ms. MIS. ▸ 52

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SHELLY HOGAN, a former IT auditor, says the job is "a partnership rather than catching [staff] in the act"

SARAH LADD

SOMEONE TO WATCH OVER IT

HE'S VIEWED WITH SCORN and mistrust by technologists, but he's critical to IT operations. Meet the IT auditor, a person with the unenviable task of letting the CIO and senior management know when things aren't running right and who's responsible. But the auditor/IT relationship doesn't have to be sour, as IT auditors can attest. It's just a matter of building partnerships.

50

Utility Buys Canned App As Deregulation Looms

Customer information system seen as key to keeping costs low, customers informed

BY MATT HAMBLEN

When Fiona Taylor started working at BC Gas Inc. in Canada four years ago, she and her co-workers had their work cut out for them.

The Vancouver, British Columbia-based company had been struggling to work with its counterparts in Alberta and Ontario to create a shared customer information system (CIS) to handle all three utilities' call centers and billing, said Taylor, director of customer works. But the customized system kept expanding in scope, and costs were going through the roof, she explained.

"It was a spectacular problem for us and left us quite risk-averse," Taylor said. "The CIO lost his job over it."

So BC Gas gave up on working with the other utilities and turned to a packaged software application instead.

Bill Swanton, an analyst at AMR Research Inc. in Boston, said it's very unusual, if not unique, for a utility to buy a packaged CIS. But because of the pressures of deregulation, he added, utilities are looking to save on software development and considering cheaper packaged systems.

At $24 million, the cost of the packaged system that BC Gas chose is only about 25% of what the company could have spent customizing one itself, he said.

And the company expects a return on investment because of cost savings it expects to see in the next four and a half years as a result of the new system.

"All of a sudden, utilities are finding that now they can make more money by being more efficient," explained Swanton. "In the past, they just passed software costs onto ratepayers."

When BC Gas started looking for a CIS software vendor in 1996, its criteria were rigid. The board of directors put a cap of $25 million on the project and set a rollout schedule of two years, Taylor said.

The project managers ruled out using top-tier CIS vendors, whose products would have cost more and taken more time to implement.

In 1997, BC Gas entered a partnership with Peace Software Inc. in New Zealand. The utility chose Peace's system, called Energy, partly because Peace offered guarantees and discounts, but also because Energy had comparative-analysis tools designed to help utilities move toward deregulation.

FIONA TAYLOR says BC Gas' average customer call has been reduced by 60 seconds

BC Gas' March 1999 pilot of the Energy system was successful, and the utility installed the system three months ago in its 77-agent call center in Prince George, British Columbia, which handles 250,000 customer accounts.

Customers can now access their account information or change service via the Web, and call center agents have an expanded Web-based database of information at their fingertips.

BC Gas plans to expand the Energy system to all 750,000 of its customers by next spring, when it will deploy the software at a 120-agent call center in Kelowna, British Columbia, according to Taylor.

The system was a bit difficult to implement, in part because it required changes in business practices. But it was worth it.

For example, in the past, if a customer asked for information, either the call center or the billing department would send out a brochure, but neither unit was responsible for tracking that a brochure was sent. Now, the back office sends out brochures from a single location, and the call center tracks all requests, Taylor said.

And agents can now access all customer information on a Web-based browser as soon as a person e-mails or telephones the company. With the new system, agents have seen a 60-second reduction in the average customer call, Taylor said.

"It's been amazingly successful, but I'm waiting every day for the other shoe to fall," she added.

Chicago Board of Trade Automates With Euro Rival

Testing new trading system next week

BY MARIA TROMBLY

The Chicago Board of Trade (CBOT), the world's largest remaining open-outcry derivatives exchange, plans to kick off testing of its new electronic-trading system this week.

The new system, developed in partnership with Eurex, a rival derivatives exchange owned by Frankfurt-based Deutsche Borse AG and Zurich-based SWX Swiss Exchange, will let traders see Eurex and CBOT data on the same screen and will permit higher trade volumes than CBOT's current electronic system, Project A.

The testing, set for launch today and scheduled to go live this quarter, comes at a time of massive restructuring for CBOT.

Last month, more than 90% of CBOT members voted in favor of splitting the exchange into two for-profit companies — tentatively called CBOT and eCBOT — in a first step toward a possible initial public offering.

Like the New York Stock Exchange, CBOT is owned by its members. It doesn't offer a place to sell actual stocks, however. Instead, CBOT lets members trade contracts for the future purchases of products like agricultural commodities or U.S. Treasury bonds.

If CBOT becomes a for-profit company, it will be able to move more aggressively toward electronic trading, said Dana Stiffler, an analyst at Newton, Mass.-based Meridien Research Inc.

Currently, only 5% of CBOT trades are made electronically because the exchange has priced electronic trades several times higher than traditional trades — a deliberate tactic to keep business from being taken away from CBOT's floor-trader members.

According to CBOT spokeswoman Katherine Spring, members pay 3 cents per trade ($1 for retail customers) using the traditional open-outcry system, compared with 23 cents ($4 for retail customers) on the old electronic platform, which is known as Project A.

"But the local [member] firms have become less and less vocal because they realize that this is the way it's going to be," Stiffler said.

With the restructuring, said Spring, eCBOT would be able to set its own prices for electronic trading.

The new system — and the planned shift to decimal-based pricing next April — are expected to generate more volume for the exchange. According to Spring, Project A wasn't capable of handling higher volumes. It would have cost CBOT $47 million to revamp it. So CBOT instead decided to go with the Eurex platform for $50 million.

"The Eurex system was the most scalable and had a proven track record," Spring said.

Currently, 75% of CBOT's volume is from member firms that belong to both CBOT and Eurex.

The Eurex platform, which has been in development since the fall, allows members of the world's two largest derivatives exchanges to be on screen at the same time, and it lets them pass the information on to their clients.

The old system, on the other hand, required a dedicated terminal, which took up more space. It also restricted the ability of traders to customize front ends to give clients information, Spring said.

After the system goes live, the next step for the two exchanges will be an alliance with an as-yet-undetermined partner in Asia, according to Spring.

JIM GORDON/REUTERS

THE CHICAGO BOARD OF TRADE should see higher trade volume after merging systems with its rival European exchange, Eurex

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Pacific Ocean Is This Navy IT Officer's Enterprise

She sees similarities to corporate IT, but scale varies

AT ONLY 35, Lt. Cmdr. **Joyce Allen-Kendrick** has responsibilities that would give pause to some civilian CIOs. Allen-Kendrick is the executive officer and second in command at the U.S. Naval Computer and Telecommunications Station in Puget Sound, Wash. She was just selected for commander and will be promoted to that rank in December.

Computerworld's James Cope recently spoke with Allen-Kendrick about her career and how the information technology challenges she faces compare with those of her civilian counterparts.

Q: How does your role as executive officer of a major Navy communications installation compare to that of a civilian CIO?

A: The military IT infrastructure isn't all that different than on the civilian side. We use off-the-shelf software like Microsoft Office. I need to keep up-to-date on the latest and greatest technologies and ensure that we're following industry standards. Training is also important.

Q: Are there any differences between civilian and military IT?

A: Our reaction time [in implementing new technologies] is slower. To some extent, that's the way government works. But we're also looking at PCs on every Navy desktop, including those at sea. And we're talking 369,000 people.

Q: Any other differences?

A: Well, there's money. . . . We have to work within our budget constraints. And we're competing for the same talent pool but [offer] fewer incentives.

Q: What's your main leadership challenge?

A: Strategic planning. . . . You have to put people who report to you in a visionary mode instead of a reactionary mode. This is the best job I've had. I have a lot of strategic thinkers on staff.

Q: Any hot projects in the works?

A: Indeed. It's the Defense Messaging System (DMS). This is a modern messaging system that's an alternative to many legacy e-mail applications now used by the Department of Defense.

Q: What's different about DMS?

A: All communications will occur in real time and will be delivered directly to the recipient's desktop.

Q: How do you deal with security issues?

A: We have the same challenges that companies have. For example, we got the "I Love You" virus but fixed it early.

Keep in mind we really do work 24 hours a day, seven days a week and can deal with these issues much more quickly.

Q: Why the Navy? Couldn't you make more money as a civilian IT manager?

A: I think about that. But I always wanted to be in the military. When I was 5 years old, I wanted to be a Marine Corps drill sergeant.

We provide computer and telecommunications services to all the Navy commands in the Pacific Northwest — aircraft, submarines, surface ships — a total of 23,000 people.

I feel like what I'm doing for my country is important. There will be opportunities after the military. I'm living my life's dream right now. ◗

RANDALL SCOTT

NAVY IT IS SIMILAR TO CIVILIAN IT; it's the content and mission that are different, says Lt. Cmdr. Joyce Allen-Kendrick

Banks Market to Small Businesses

BY MARIA TROMBLY

Small businesses have traditionally been given the cold shoulder by large banks. But thanks to new offerings from electronic banking vendors, things are beginning to change, according to a new report issued by Cambridge, Mass.-based Celent Communications.

Small businesses can be a boon for banks because they have higher balances, make more transactions and borrow more than retail customers, said Celent analyst Meredith Hickman.

These characteristics — combined with Internet growth — have pushed small-business needs to the forefront of many banks' e-commerce strategies, she said.

Among the services banks offer are browser-based account access, online payroll, small-business portals and wireless access to banking information, said Hickman.

Part of what makes this possible is the proliferation of ready-to-use electronic banking service providers.

The top vendor, according to Hickman, is S1 Corp. in Atlanta, which has more than 300 banking clients using the cash-management system from its Q Up subsidiary in Austin, Texas.

The next biggest operator is Digital Insight Corp. in Calabasas, Calif., with 160 companies utilizing its Axis Cash Management system.

The only other firm of the 14 Hickman ranked that boasted more than 100 clients was FundsXpress Financial Network Inc. The Austin-based company reported 119 clients using its FundsXpress Commercial Banking product.

Of the three firms, Digital Insight offered the most services, such as account reconciliation and automated sweep instructions.

Paul Jamieson, an analyst at Lincoln, Mass.-based Gomez Advisors Inc., disagreed with the report, saying that most banks see small businesses "as a crucial and very profitable market." Though as far as online operations are concerned, Jamieson said, "the demand for online services has not met expectations." ◗

ASPs' Outsourcing Raises Risks for Clients

BY JULEKHA DASH

Some application service providers (ASP) are relying on hosted services themselves to help manage their growing businesses, a trend users need to be cautious of, say analysts.

Industry experts warn that relying on an ASP that itself relies on an outside service provider can increase the risk for customers. As a result, buyers need to ask for detailed service-level agreements and make sure their ASPs have similar agreements with their own providers.

Frank Zamani, CEO of San Jose-based database hosting service Caspio Inc., plans to hire an ASP to provide remotely hosted customer relationship management (CRM) software that will track his growing list of clients.

CRM software is particularly useful to a growing services business because it tracks customer information and thereby allows a company to improve its own service levels, which are the measure by which ASPs are judged, according to Amy Levy, an analyst at Summit Strategies Inc. in Boston.

In an ASP arrangement, users pay a monthly subscription fee to access applications via the Internet or a virtual private network.

Double Hosting Yields Savings

Zamani said hiring an outside firm to supply a CRM application would give him access to customer information in a matter of days rather than months. It also would save him from spending a lot of money up front and hiring people to support the application.

"Hiring IT staff is very difficult. When you get them, you want them to focus on your core business," he said.

Normal Liang, CEO of LocalMIS.com Inc. in New York, said he also plans to buy CRM services from an ASP within six to nine months. LocalMIS is an ASP that targets small and medium-size businesses in certain vertical markets and relies on resellers to distribute its services.

Like Zamani, Liang said he believes using an ASP would mean faster implementation, particularly if the ASP also offers training and consulting services.

These relationships among ASPs make it even more important than usual for end users to get bulletproof service-level agreements, according to Peter Bendor-Samuel, CEO of The Everest Group, a Dallas-based consulting firm.

For instance, if a company selects a CRM service provider that in turn selects an outsourcer to host its servers, there are more potential points of failure that could leave an end user stuck, he said.

Levy added that contracts with ASPs should include provisions that allow end-user companies to be compensated for downtime — not only from the primary ASP but also from any service it employs.

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WORKSTYLES

What It's Like to Work at . . . Hecklers Entertainment

Interviewee: Darren Nelson, chief technology officer
Company: Hecklers Entertainment Inc., a producer of destination sites for America Online Inc. and the Web
Main location: Birmingham, Ala.
Number of information technology employees: Three, including Nelson
IT hiring plans: "I'll probably hire an assistant to handle more of the miscellaneous issues. It will be someone who I can train – not a certified Microsoft professional, but basically a geek who's into computers."
Number of employees (end users): About 35. "We've doubled the staff in the last five months."
Average age of staff: 24 to 25
Web traffic: 2 million unique visitors per month for all the sites combined
New IT initiatives: "I'm focusing about 90% of my time on evaluating and selecting a new content management and delivery system. Our second priority is organizing our internal IT systems – deciding who will be responsible, which ones we'll outsource and which we'll do ourselves."
What are your goals with content management and delivery? "We've gotten by on a limited budget to date, and now we need to upgrade to compete with a lot of the functionality that other sites have already. We want to minimize errors, make consistency a priority and polish the presentation of the content we have already. We also want more personalization features. And wireless is a big effort."
Initial public offering plans: "That's the ultimate goal. We recently had a big round of financing."
Stock options: "We want to give everyone a chance to own part of the company and make sure we are all working in the same direction to meet common goals. Stock options create a team atmosphere."
How formal are the employee reviews? "We're getting more and more formalized as we go. Until about six months ago, we were all wearing a lot of hats. We didn't have a dedicated [human resources] person, so we just did the best we could. Now that we have an HR person, those things are falling in place."
Dress code: Casual
Workday: "I arrive about 6:45 a.m. and leave about 6 p.m. My staff arrives between 8:30 and 9 and leaves around 5 or 5:30."
Why do they work fewer hours? "Their schedule is up to them – you get out of it what you put into it."
Computers: "There's not a single standard. The gamers get higher-end systems with the most recent processors and video cards so they can play the latest games. Most people get standard office PCs."
Must people carry beepers? Cell phones? "I don't have to, but I do. We communicate a lot through [AOL's] Instant Messaging. I'm logged onto AOL at least 12 hours a day here, and again at home."
Percentage of staff that telecommutes on a given day: "The majority work here in the office, but we have remote staffers in Joplin, Mo., Chicago, Boston and California."
On-site amenities: Myriad video-game systems and a recreation room with a video game player hooked up to a large LCD screen. "We have a Dreamcast instead of a basketball hoop."
With a name like Hecklers, is work a constant laugh-fest? "No, but we definitely try to make it as fun as possible. Sometimes from my office I can hear [one of the company's voice talents] in the lounge doing cartoon voices. Or when we post new content, you'll see people gathered around a computer laughing at it."
Little perks: "We get a lot of free beta copies of games being developed. We already have a Sony PlayStation 2, which won't be released in the U.S. until September. Occasionally we have a themed workday, like Hat Day."
Would employees feel comfortable e-mailing the CEO, Hank Suerth? "Sure, there's an open-door policy."

– Leslie Goff (lgoff@ixnetcom.com)

ALAN PALLER

A security skills test

MY WIFE DOESN'T LET me do any electrical work around the house. Smart woman.

Despite my engineering degrees from Cornell and MIT and my professional engineer's license, I don't have the requisite knowledge to be a competent electrician. I've never been trained to do that type of work; I don't know the accepted practices or where hidden dangers lie. If I were to claim such expertise and take responsibility for electrical systems, I could hurt or kill people.

Unskilled computer security people also do harm. They hurt their organizations by allowing others to steal credit-card information and other important data or to put the computer-based parts of their organization out of business for short or long periods of time. And they can damage other organizations.

The recent distributed denial-of-service attacks on sites such as eBay and Yahoo were directly enabled by security mistakes almost certainly made by unskilled systems administrators at the University of California at Santa Barbara and other universities and institutions.

Similarly, unskilled information security officers are taking responsibility for managing the security of major systems. Because they don't know how to secure them, they create policies that no systems administrator can implement and then blame the administrators when security is breached.

Neither systems and network administrators nor information security officers have been asked to prove that they know how to secure their Internet-connected systems. And they haven't been given the time to train for their jobs. Without the confidence that builds with adequate training, they're uncomfortable demanding the resources needed to keep systems safe. They go along day to day telling management that everything looks OK, all the while holding their breath.

It's time to stop the charade.

The first person to publicly describe the damage being done by untrained security people was Stephen Northcutt, who headed information warfare at the U.S. Ballistic Missile Defense Organization and now heads the SANS Institute's Global Incident Analysis Center. For the past year, Northcutt and a team of global security leaders have collaborated to identify the minimum necessary skills — what they call "security essentials." One of his team leaders provided a set of exemplary questions that organizations can ask their information security officers and systems administrators to determine whether they have the essential skills necessary to be considered minimally qualified for the most basic sysadmin and security jobs:

1. *Which of the 10 most critical Internet security vulnerabilities as published by the FBI and SANS (see www.sans.org/topten.htm) are present on each of your Internet-connected computers? Why is each one dangerous?* The answers will help determine whether the person knows what the biggest security threats are and whether those threats affect his organization.

2. *What specific events are and are not being audited on each system? What tool is monitoring and analyzing the audit logs? What has it found in the last 24 hours?* This helps determine whether you have an ongoing security monitoring activity.

3. *When was the last time you checked the system backups to be certain they restored files accurately? How frequently is each system backed up? If you were called in during a security emergency, would you be able to do a backup to retain the data for later analysis?* This verifies that the person knows and acts on the knowledge that the greatest damage from security incidents is often a loss of information that could have been avoided had backups been current and uncorrupted.

4. *What protocols and ports are being blocked by the firewall for both incoming and outgoing traffic? Is that sufficient?* This verifies that the person has an understanding of basic perimeter protection.

Unskilled computer security people also do harm.

These aren't the only questions that will determine the knowledge and skills of sysadmins and security professionals, but they can serve as an early-warning system to identify dangerous skills shortages. Though IT managers may not be able to secure their systems, they can be held responsible for ensuring that the people they hire are minimally qualified.

Paller is research director at the SANS Institute in Bethesda, Md. Contact him at alanpaller@aol.com.

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Revenge of the Dot-Nots

Companies without stock options are finding new ways to outcompete dot-coms for talent, putting their focus on leading technologies, training and fun environments. By Julia King

YOU HAVE NO STOCK OPTIONS to offer. There's no pinball machine or air hockey table in the coffee room. You prefer that workers leave their dogs at home. And your company is in an industry with a low glamour factor — say, groceries or insurance.

In short, you're a dot-not.

So how do you compete for the scarce information technology professionals that virtually everyone — most notably much higher-paying and far hipper dot-com companies — are trying to attract and retain?

At Widener University, a private, 2,400-student college in Chester, Pa., luring such talent is certainly not done with money. Salaries for some of the university's IT workers fall as much as 20% below the region's median pay rate.

Yet in the past few years, Gary Habermann, director of technical resources, can recall losing only two IT employees to dot-coms.

His secret: "I've tried to put together an environment that makes it fun for people to come to work," he says. "I try to pay them to play with toys."

Other dot-nots are luring technical talent with the promise of ultraflexible working hours, a casual work environment and a better work/life balance.

At Widener, the university's high-tech toys are located mainly in a $4 million technology lab. The lab houses hardware and software, such as technology for streaming video applications that Widener's IT staffers get to experiment with as much as six months before it hits the market.

"We're a huge believer in alpha and beta testing because it's my belief that if we're going to use a product, we should know it better than the engineers who built it," Habermann says.

By forging relationships with multiple vendors, "We've earned a reputation as reliable testers," Habermann says. The hardware and software that make the grade usually end up in the university's 10,000-node network, which spans 90 buildings and runs voice, data and video applications. Habermann has also contracted for Widener to provide technical and network support, which includes purchasing PCs, to 12 local school districts.

Passing Along the Perks

Because of the huge volume of business he generates for vendors that supply all the equipment, Habermann is able to buy the gear at a substantial discount. He can then pass the savings on to his staffers in the form of bonuses and salary increases to help bring both in line with the local market.

Other perks include casual dress, flexible hours and free tuition for employees, their spouses and their children. "I just hired an engineer away from Nortel because he has two girls who in another few years will be ready to start college," Habermann says. "If you've got kids and need to put them through school, you can't beat working for an educational institution."

Also, measured in pretax dollars, tuition at Widener costs $16,000 per year, so for two children, that represents an additional $32,000 — an annual bonus most IT workers, even those at dot-coms, aren't guaranteed to receive in cash, Habermann says.

Boll Homa, CIO at Hannaford Brothers Co., a chain of 155 grocery stores based in Portland, Maine, says he also believes in touting the company's leading-edge technologies to both prospective and current IT staff. More so than money or stock options, new technologies are what often appeal to technically oriented workers, Homa says.

For example, Hannaford is about to launch a pilot project deploying wireless technology and two-dimensional product codes in its stores. It's part of a longer-term supply-chain project to do computer-assisted reordering based on point-of-sale data.

"We do talk about this during the interview process," Homa says. "We try to make them see that if they want new technology, they don't have to go to a dot-com."

He concedes that there are "not too many dot-coms in Maine," but the competition with them for IT talent has nonetheless been fierce because Boston's dot-coms are less than two hours away.

Homa, who moved to Maine three years ago from his home in Connecticut and a previous job for which he commuted 50 miles to New Jersey, also emphasizes the quality of life in Maine. "It's very inexpensive to live here," he says. "There's low crime, good schools and access to incredible sports all year long."

Homa's recruiting efforts have largely succeeded, he says, "by giving people access to interesting things to work on and by implementing technologies that have a true impact on the business so people can see a direct correlation between their work and the business."

Just 45 miles west of Boston, Allmerica Financial Corp. in Worcester, Mass., faces even stiffer competition from big-city dot-coms. To help attract and retain IT talent, the company has instituted several

new compensation and training programs.

As a result of those programs, the IT staff turnover rate has dropped from more than 20% to 10% in the past two years, according to former CIO Robert Bruce. (He recently left Allmerica to seek a position in operations at a technology company.)

Among other things, Allmerica tripled its IT training budget to give staffers access to new technologies. On the salary side, the company completely revamped its compensation programs, including upgrading salaries to bring them in line with market levels. To establish these levels, Allmerica "much more closely" scrutinizes multiple salary surveys and studies them twice annually. Before, it reviewed surveys only once a year, Bruce says.

The company also implemented a bonus program for workers whose skills may not be leading-edge but are nonetheless in high demand. These include Oracle database administrators, network administrators and C++ programmers, who are paid bonuses ranging between $1,000 and $3,000 every fiscal quarter.

The program is administered by senior technical experts, who are in the best position to gauge which skills are most in demand based on the level of difficulty they may be having staffing a particular project, rather than by IT managers, says Bruce.

Opportunity Cost

In contrast, IT employees with dot-com experience say that many dot-coms are under too much time pressure to have their technical experts closely consider co-workers' skills, much less help administer employee retention programs.

Margaret Schweer, director of IT human resources at Northfield, Ill.-based Kraft Foods Inc., says she believes a company's IT salary dollars are best spent retaining the best IT talent rather than trying to prevent workers from heeding the siren song of dot-coms.

Schweer maintains that at best, IT managers and corporations in general can influence perhaps 20% of what goes into an employee's decision to flee for a dot-com or any other company. "It's the market that's driving turnover. Turnover happens. Just get over it," she says, adding that it pays to try to control the "flow and direction" of staff turnover rather than trying to halt it altogether.

So forget about copycat pinball machines or all-day cappuccino service. There are some very basic things that companies can do to compete on the same level as dot-coms during the recruiting process, especially when college graduates are the target group.

One way to compete is to act more swiftly than large corporations are accustomed to acting. Dot-coms typically notify prospective employees of a hiring decision within 48 hours. Larger companies need to do more of the same, Schweer says. "It's a new economy, but we [larger, non-dot-com companies] still work on envelope time. That has to change."

GARY HABERMANN at Widener University can't offer employees the same high salaries as dot-coms, so "I try to pay them to play with toys," he says

ots

OVERCOMING INSECURITY

Security infrastructures are full of holes, but most of them are human, not technological. Security experts don't make the decisions, and the people who do are tired of listening to them. It's time to change that. By Deborah Radcliff

SECURITY AT MOST businesses today is broken. Intrusion and virus detection measures react to threats only after they've been discovered in the wild. Firewalls bog down traffic, not to mention that they have security vulnerabilities of their own. And because there are so many points of vulnerability across an enterprise, no one's really managing it all. Point products plug specific holes but don't talk to one another, making a bad situation worse.

Problems like these leave a bad taste in the mouths of most corporate executives, who see security as clumsy, reactive and confining, rather than the protective cover security managers say it can be to help businesses advance online quickly and safely.

"People try to ignore security because they perceive it as something that will make their tasks more difficult," explains Ian Poynter, president of security consulting firm Jerboa Inc. in Cambridge Mass. "We'd like to see security as an enabler so you can actually use it as a selling point to your senior management."

So security managers say their real challenge is to put information security in its rightful place as a way to make business work, not slow it down. That means creating a proactive, scalable and flexible security infrastructure that's ready to accommodate new applications, mergers and other network changes in real time, according to John Pescatore, an analyst at Gartner Group Inc. in Stamford, Conn. [Technology, July 10].

And therein lies the vicious circle: How do security managers sell a network upgrade when security already has such a bad reputation?

It'll take a change in corporate culture.

Start With the Simple

The first level of change is teaching non-IT people that data security is a problem that must be addressed in the physical world, not just in a technical context, says Pete van De Gohm, chief security officer at Enron Energy Services in Houston. "You need an integrated approach where all of your employees understand the value of the information that they have and correctly label it, whether it's a physical or a logical medium," he says.

Van De Gohm, who manages both information and operational security at Enron, says he practices what he preaches.

The deregulated energy industry is fiercely competitive. So van De Gohm designed the physical layout of Enron's offices so there's no outside entry near the mergers and acquisitions department. This way, he physically protected a key area in which the company's most important competitive data is stored and processed.

During the past two years, the Federal Reserve Bank of New York has also rolled out an aggressive program to educate and inform users, business man-

agers, executives and even armed guards about the way digitized assets can be compromised.

But to make them understand, you have to learn their concerns and explain the situation in ways they can understand and put to practical use, says Jenean Paschalidas, director of security training and policy enforcement at the New York Federal Reserve.

Paschalidas has gone so far as to compare the bank's digitized money to that of the gold bullion in the bank's basement vault. That comparison helps the bank's armed guards realize how important it is to guard modem ports and check for disks and laptops that people carry out of the bank's Manhattan buildings.

The bank also has adopted a strong user education program — the type of program that should be the linchpin of any organization's security policy, according to John Lucich, president of the High Tech Crimes Network (*www.htcn.org*).

For companies that don't have as many resources as the Federal Reserve, Lucich suggests using technology to help enforce user policy.

"We talk about segmentation, demilitarized zones and other elements of a secure architecture. But then end users have access to anything they want, even though you wouldn't let your servers have that access," Lucich explains. "So end users should be segmented through a firewall inside the network that won't let them do unsafe things."

Changing From Within

Just as important to this employee education process is the technical staff, many of whom commit security gaffes of their own (like punching holes through firewalls to let certain types of traffic in to support new applications, or downloading cool technical stuff they shouldn't).

"Once employees are aware of the value of their intellectual property, then those who design the technical infrastructure can see how this information logically goes through the network and see all the possible ways that information can be vulnerable," van De Gohm explains. "Then they use technology to mitigate those vulnerabilities."

For example, the vast majority of vulnerabilities reside in the application code itself. So some of the most intensive training should be offered to the programming team so programmers can learn how to develop code that's free of common vulnerabilities, says Poynter.

In fact, all change control policy should formally include security sign-off on projects, says Paul Raines, vice president of information asset protection at the Federal Reserve Bank of New York.

"This is one of the most difficult challenges a security manager has," Raines explains. "Developers don't know security. But they don't like security people hanging around because they think the security staff holds things up."

So the security manager must get buy-in from the top, he says. But the people at the top won't buy in to processes that may not be able to keep up with the flow of business.

"Are you going to tell your stockholders that we decided to delay our next version for three months while we figure out the security bugs?" Raines asks. "No. Most companies put applications on the Web and let hackers do the beta testing on the security holes."

This is why it's important to change the mind-set of the security group from one that bogs down business to one that enables business, Pescatore says.

"Too many security groups are focused on auditing problems vs. proactive enablement of business," he explains. "The security group needs to change from being the group that says 'no' at the end of a project to the group that gets involved in the beginning of a project by building secure hooks into the infrastructure."

That means developing review processes and tweaking the infrastructure to keep pace with business development cycles, from concept through change management and beyond, Poynter adds.

For example, businesses today are grappling with a proliferation of wireless devices like the personal digital assistants and cellular phones that are now accessing their networks. Obviously, these devices are becoming valuable business enablers by supporting all types of remote inventory and order-entry applications. But it's nearly impossible to authenticate and grant privileges to these devices because their ability to use passwords, user names or encryption is almost nonexistent.

So, instead of inhibiting business flow by saying, "No handheld access devices because they're insecure," the security manager can raise questions that would solve the user problem while minimizing risk — questions like, "Should we allow all of our users in from all these devices? Should we let them do all things from these devices?" says Pescatore.

Erasing the Security Lines

As security personnel learn to work proactively with other business and IT departments, their next payoff will be a merging of IT roles and responsibilities, Lucich contends.

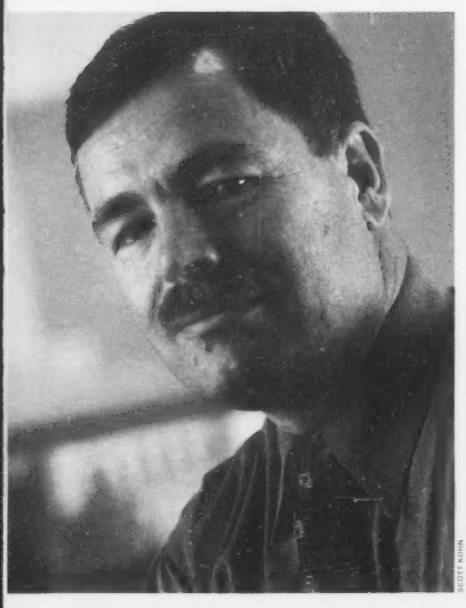
"You can't have these segmented IT domains where the leader of each domain doesn't answer to anyone in another domain," Lucich explains. "Everyone talks about the coming convergence of technologies. Sooner or later, you'll also see the convergence of responsibilities. Then there needs to be a chief security officer who says, 'I'm the one in charge of this infrastructure, and the key pinnacle here is security.' "

But to make this cultural change, security managers must drop their hard-line stances on "bullet-proof" security and learn to manage risk, Raines says. That means levels of security will be different for every situation, depending on what you most need to protect, what resources you're willing to put toward that protection and what you're willing to risk to allow business processes to flourish.

If security professionals can show others in the organization that they can balance the needs of business against risk and protection, then it won't be long until they're invited into the boardroom to articulate security issues, Raines says.

Only when all these elements — awareness, integration and boardroom buy-in — come together can security managers push their agendas toward building a comprehensible, flexible security architecture.

So say goodbye to the fortress mentality — guns, locks, fences and dogs, says van De Gohm. And, he adds, work to get everyone on the same page: "The integrated approach is the best security process there is." ◗



SCOTT KOHN

PETE VAN DE GOHM at Enron Energy Services espouses an integrated approach to security

WHERE'S YOUR WEAK LINK?

NO MATTER HOW PROACTIVE your security infrastructure may be, there's still the weakest link to think about – the company's human population.

Therefore, security policy is key to making or breaking an organization's information-protection measures, says Paul Raines, vice president of information asset protection at the Federal Reserve Bank of New York. That's why Raines' organization enforces a strong security policy throughout the user population.

Start by keeping the policy simple, Raines suggests. Put it in language that users understand. And keep it short. (Raines' group keeps its user policies to two or three pages.) Key points to consider, he says, include the following:

- Avoid unauthorized access to resources outside the company's network.
- Don't allow people to transport intellectual property outside the company.
- Use strong alphanumeric passwords, update them regularly, don't share them with anyone and don't hide them near computers. To avoid forgetting, Raines advises using passwords that sound familiar when spoken, like ipa2thflg ("I pledge allegiance to the flag").
- For road warriors on laptops, use application-level encryption, work off disks and keep them with you, or remove and vault the hard drive.
- Don't put any sensitive data on handhelds. If they can access the network, install password programs on them.
- Delete user accounts upon employee termination and recover all equipment used by that employee to access the network.

At the network level, Raines also advises periodic security tests – everything from war dialing (automated calling of banks of phone numbers) in order to find undocumented modems to encrypting stored data on servers and checking password strength with password-cracking tools. – *Deborah Radcliff*

Last year, computer hackers
cost businesses 45 billion dollars.

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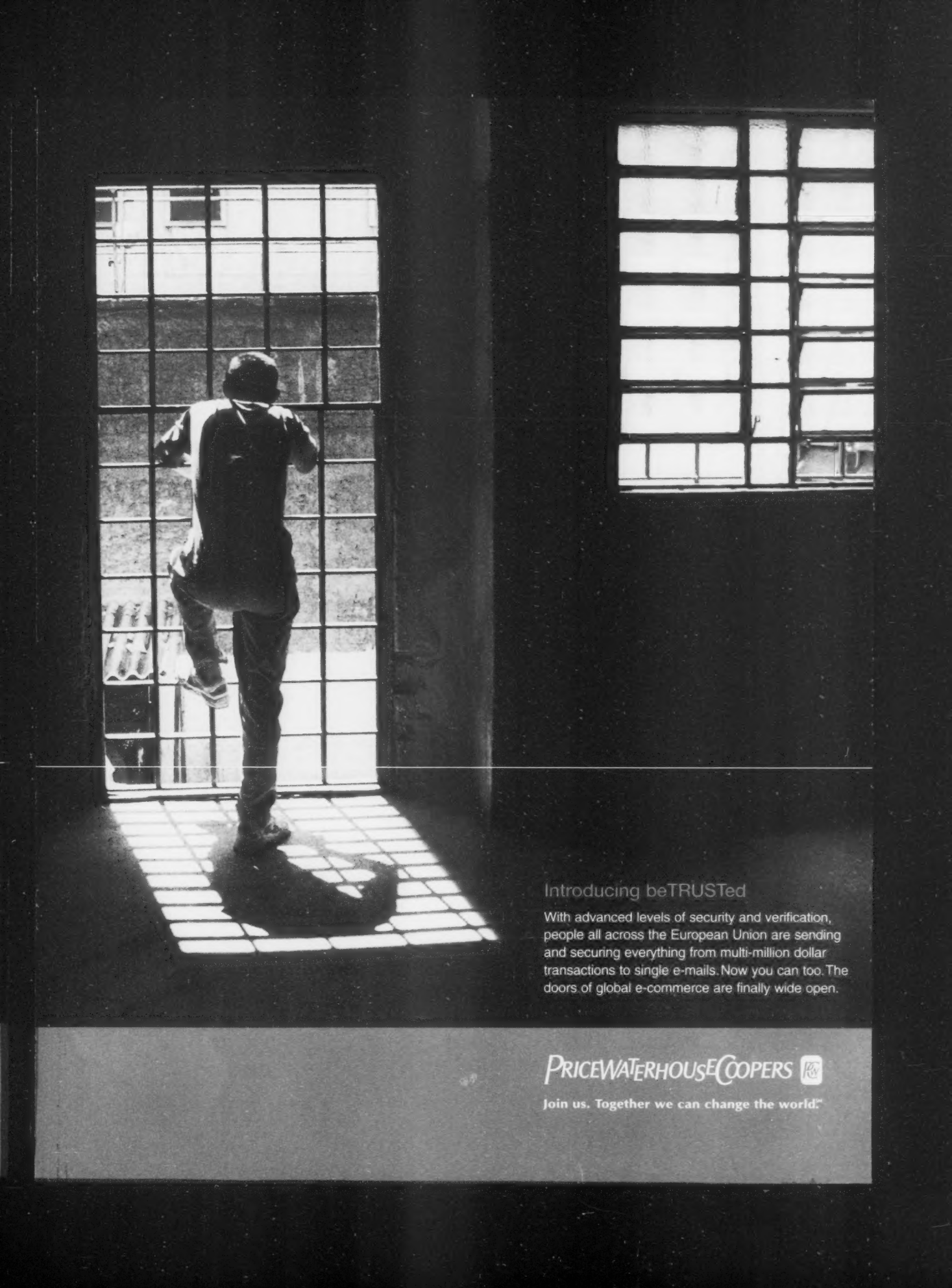
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Hiring an IT Leader?

Demand is strong for corporate IT executives, and it will take more than an attractive pay package to land the person you want. Here are seven strategies. By Alan Horowitz

TED DELLA VECCHIA was in his first round of a multiday interview process for the CIO position at Starbucks Corp. Suddenly, in popped someone who politely asked to join the discussion for a moment. The visitor was the company's legendary founder and chairman, Howard Schultz. "He shared what was on his mind. He wanted to give me a chance to meet him," says Della Vecchia. "He was very impressive."

Demand is strong for information technology professionals, especially for top-level IT executives such as CIOs, chief technology officers and executive vice presidents. Senior executives need to woo these in-demand IT gurus, and Schultz understands this. To attract a good person, the company's top dog must be involved. Della Vecchia got a job offer at the Seattle-based coffee-store chain and took it, in part, he says, because he felt that the highest levels of Starbucks' management were supportive of him and his position based on what Schultz told him.

The following are seven strategies that can help bring in — or keep — a top-level IT executive:

1. Include the CIO in the 'inner circle.' "One thing becoming very important today, more so than ever before, is to organizationally have the CIO report directly to the CEO [ideally], or the president or [chief operating officer]," says Beverly Lieberman, a principal at executive search firm Halbrecht Lieberman Associates Inc. in Stamford, Conn.

"Allow the CIO to share the table with the top management of the company. Treat them as an equal member of the executive board," adds Barbara Gomolski, research director at IT workforce research firm Gartner Institute in Eden Prairie, Minn.

CIOs want to expand their influence beyond IT and make a contribution to the company's bottom line, says Ernie Park, vice president and CIO of Global Business Services at Honeywell International Inc., an aerospace and automation company in Morristown, N.J. CIOs must be engaged in developing business strategies, not just IT strategies, he notes.

By personally meeting with Della Vecchia during his interviews, Schultz sent a message that everyone from the chairman on down considered the CIO a part of the top management at Starbucks.

2. Pay is important. "[A CIO] has to have an extraordinarily competitive compensation plan," says Lieberman. "It may not conform to the way you're paying other executives. They are higher paid than those in other functions not because they are intrinsically more valuable, but it's supply and demand."

A competitive salary isn't enough, though.

"You don't get top-level execs with just the compensation plan. You need an equity plan," says Charles Foley, executive vice president and CTO at Inrange Technologies Corp., a Mount Laurel, N.J.-based provider of enterprise infrastructure. This means stock options or other equity plans.

3. Pay attention to "soft" issues. "So many times, what people are attracted to are the intangibles: Is there a crystal vision? Is it well articulated? Is it compelling?" says Wade Myers, CEO of Interelate Inc., a business analytics application service provider in Minneapolis.

Don't ignore what's in it for the CIO. "We are looking for challenging learning opportunities. We have to be able to grow," Park says.

"The soft stuff is really what drives retention [of CIOs]," says Della Vecchia. "Those who are driven just by money aren't going to be happy and fulfilled, no matter what."

4. Provide support. The top IT executive doesn't want to go on bended knee for money. "Give him enough budget to bring in good technology," says John A. Challenger, CEO of Challenger, Gray & Christmas Inc., a Chicago-based outplacement firm. Challenger says cutting-edge technology is needed for running the business and helping the CIO attract top-flight IT talent.

5. Show commitment from the CEO. Time was, many CEOs ignored or were even intimidated by technology. If that's still the case in your organization, attracting and retaining top IT executives may be impossible.

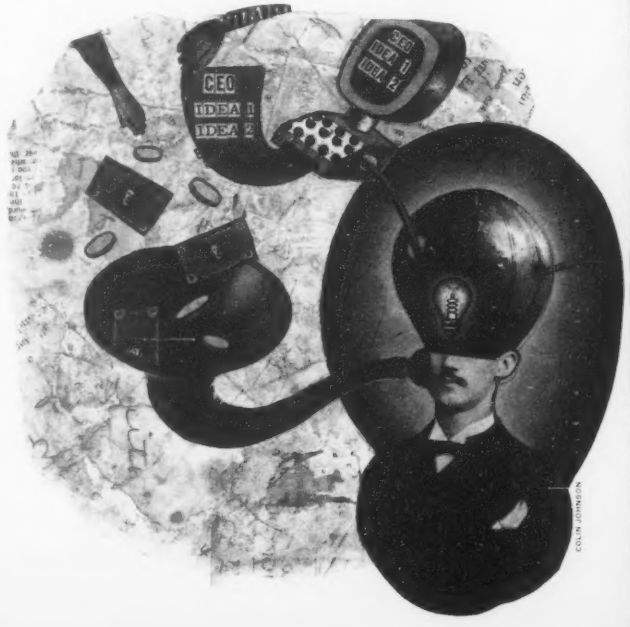
"The CEO has to be willing to invest personal time and make a commitment to learning more about IT. They can't avoid it or hide or delegate it," warns Lieberman.

6. Provide leading-edge technology. No matter how much money and adulation a professional athlete gets, the really good ones still retain some of the enthusiasm for the game that they had when they were learning it as kids. The same is true of top IT managers. "Even at a high-officer level, these folks are still attracted to the technology. They're still turned on by it," says Randy Ynegas, human resources director at STech, the IT division of Charles Schwab & Co. in San Francisco. Terry Gallagher, president of Battalia Winston International, an executive search firm in New York, calls the latest technology "a big turn-on for CIOs." The right technology helps attract and retain IT executives. These people still like to play with cool toys.

7. Look within. Gomolski recommends looking for top talent inside the organization. Her reasoning: It's taking companies up to four months to fill staff positions, and, she says, "It's not hard to imagine [that] it will take a year" to fill a CIO spot. Recruiting from within can save time. And perhaps even more important, Gomolski adds, by promoting an employee, you can largely overcome the chances of a mismatch between a person you bring in from outside and your corporate culture.

Steve Finnerty, senior vice president and CIO at Kraft Foods Inc. in Northfield, Ill., says of promoting from within, "The insider knows the company [and] has built up relationships." While he acknowledges that an outsider can provide a fresh perspective by "staying connected to the outside world" through trade shows and seminars, Finnerty says such a shortcoming can largely be overcome.

Horowitz is a freelance writer in Salt Lake City. Contact him at alan@ahorowitz.com.



NICK CARDILLICCHIO

24/7 CONSULTANT

For independent consultants like Vanda Collis who are on call every day, all the time, the biggest challenge each week can be determining where their professional lives end and private lives begin. By Leslie Goff

VANDA COLLIS was sitting in the late-night glow of her PC, answering e-mail from her home office at 1 a.m., when the telephone rang. Her first thought was that it must be a fax; her second was that it was a possible family emergency. But instead, it was a business call — a consultant in Korea who wanted to line her up as a U.S. business partner for his fledgling Web venture.

Collis laughed, with relief and then surprise. The caller apologized profusely for not realizing the late hour stateside. And they spent the next hour discussing a potential business deal.

Such was the end of another typically long day for Collis, an independent information technology project manager who, with her husband, R. C. Collins, runs Waltham Park Resources International Inc. from their home in Ridgewood, N.J.

Since Collis gave up full-time employment early last year to join her husband as an independent consultant, her personal and professional lives have merged into a seamless whole, with little demarcation between where one ends and the other begins.

"A typical day is a very rigorous day," Collis says. "We are our own support team, sales team and business development team, the strategists and the implementers, the bookkeepers and the mail room. We have to project-manage our lives."

Collis isn't alone. While those who choose the consulting life find that it often offers greater financial rewards and more interesting technical opportunities, they also find that it means being on-the-ready 24 hours a day, seven days a week. An average week for Collis illustrates the round-the-clock nature of the job.

The first thing Collis does in the morning is try to rouse her three children — ages 9, 7 and 5 — for a sleepy goodbye before she heads out the door. She's on her way just after 6 a.m. and catches a 6:24 train bound for Manhattan, where she's managing a financial services firm's Web site redesign at consultancy iXL Inc.

By 7:30 or 8 a.m., Collis is at her desk in Atlanta-based iXL's New York offices on West 14th Street. For the first hour, she works on a client presentation or updates the project management plan. Then she's on the phone, confirming costs with suppliers, coordinating with other functional groups supporting her project, touching base with engineers and the creative department and nailing down details with project leaders on her team.

Next up is a review session or presentation with the client. "I'm on stage for two hours," she says, "taking the client through what we've done and showing them what we'll do next to make the project succeed."

For the rest of the afternoon, she's working on project definition documents, preparing action plans, reviewing current processes and assessing where best practices can be applied. That involves researching best practices for the financial services industry — much of which Collis does on the weekends.

On a good day, she's out of the office by 6:30 p.m. and home by 8 p.m. to read to her kids, ask them how their day was and tuck them in for the night. After eating a quick dinner and bouncing some new ideas off her husband, she's in front of her PC. She wraps up e-mails, responds to inquiries from past clients and potential customers, and makes notes for the next day.

All told, Collis and Collins each put in about 50 to 60 billable hours per week. On top of that, they commute into New York together a couple of times each week (though they typically work for separate clients) or grab a dinner out so they can review upcoming projects or brainstorm new ideas for the business.

Weekends are just as full. In between soccer games, two Girl Scout troop meetings (she's the troop leader for each) and church, Collis makes time to do research and continue discussing new business development and strategy with Collins.

On Sunday nights, when the kids are allowed their only weekly television time, Collis and Collins go over the books, pay the bills and enter their expenditures into QuickBooks. "That's our wind-down time," she says.

But Collis says she thrives on the challenge of keeping everything together. "I've had the option to take a year off and just breathe, but I enjoy being busy and doing what I'm doing," she says.

That passion, in fact, is spurring her to add more pressure to the mix: She's pursuing a Ph.D. in project management at the Stevens Institute of Technology in Hoboken, N.J.

Although she's actually working more than she was as a full-time employee, Collis says she feels like she has more options as a consultant. One of those options: No matter what else is going on, she can drop everything to see her kids in a school play or other activity. "I'm there for them. That's the only exception I allow myself for not working," Collis says. ◗

Goff is a freelance writer in New York.

UP CLOSE & PERSONAL

Vanda Collis: 24-Hour Consultant

Previous IT experience: Fifteen years in financial services with employers such as J. P. Morgan & Co., The Chase Manhattan Bank and, most recently, Fleet Bank, where she worked in retail banking IT.

Education: A master's degree in organizational psychology, Brooklyn College, 1990 (thesis explored the impact of computers on individuals); MBA in MIS, State University of New York at Binghamton, 1987.

Skills: IT project management; quality assessment and testing; applications development in mainframe, client/server and e-commerce environments.

Why consulting? "I wanted to do heavy-duty work in e-commerce, and New York City is the mecca for that. At Fleet, I was doing some high-level e-commerce work, but I wasn't managing actual projects – I was more involved with the customer relationship management and channel-changing aspects."

The best thing about it is: "I'm working for myself, and I'm extremely happy as my own boss."

The worst thing about it is: "You're constantly on the go. You must know when to take a time-out, and sometimes that's pretty tough."

Typical workday: 5:30 a.m. to 12 a.m. or later

Current client/project: Working with consultancy iXL, managing the redesign and development of a financial services company's Web site.

Other commitments: Getting to soccer practice and games for two of her children (her husband coaches one of their teams); leading two Girl Scout troop meetings (one daughter is a Daisy; the other's a Brownie); organizing a one-week Vacation Bible School program each summer; attending weekly classes at the Stevens Institute of Technology in pursuit of a Ph.D. in project management.

She couldn't do it without: Her live-in child care provider.

If her husband weren't her business partner: "He'd have to be very, very understanding."

INFORMATION technology auditors don't like to think of themselves as cops, but they do monitor IT projects for delays, mistakes, undue risks and other costly and embarrassing problems.

Often coming from corporate auditing backgrounds, IT auditors have to evaluate two areas: project progress and political winds. It's an IT auditor who must tell a powerful CIO what's gone wrong under his command and then break the bad news to senior management.

Even aside from those delicate political issues, the IT auditor's job is getting harder. That's because the pace of IT deployment has picked up as companies work to roll out Internet projects in Internet time.

"Being an IT auditor is a thankless job," says Bruce Webster, a director at PricewaterhouseCoopers in Washington.

If the auditor doesn't find any problems, people question his effectiveness, Webster says. "If you do find problems, the people in charge of the project argue against you," he says. "The only way you are proven right is if a project fails."

That's a lot of guff to take for middling salaries. The average staff-level IT auditor earns $42,000 to $45,000 per year, while an IT audit manager makes $70,000 to $75,000, according to a recent poll of 1,220 members of the Information Systems Audit and Control Association (ISACA), a trade group in Rolling Meadows, Ill.

IT auditors generally find more respect at financial services firms than at firms in other industries, notes Mark Keil, an associate professor of IS at Georgia State University in Atlanta.

Banks, insurers and other financial firms are most receptive to auditing because of the exacting nature of their business, Keil says.

To increase the visibility of IT auditors among corporate management, ISACA launched an offshoot group called the IT Governance Institute (*www.itgovernance.org*) in May. The idea is to encourage the business side of the company to work more closely with technology managers. That includes building a higher profile for IT auditors, an ISACA spokeswoman says.

IT auditing has been a quiet career niche, often separate from overall corporate auditing, she says. "But that has to change if businesses — especially when they rely so heavily on technology — are to be successful," she says.

GAINING TRUST

Through her own trial and error, Shelly Hogan has discovered that it's best for IT auditors to get involved at the start of a project and help guide it to a successful finish, rather than come in after its rollout to assess the damage. Plus, problems that are spotted sooner are typically cheaper to fix.

That kind of proactive approach might sound like common sense, but it was initially hard to enact because of mistrust between the IT and auditing staffs, says Hogan, who until last month was an IT auditor at American United Life Insurance Co. in Indianapolis.

"Not being on the best side of IS professionals, they don't want to give you a lot of information about what they're doing and how they're doing it," she says.

But Hogan pressed on by regularly attending IT planning meetings and working to convince technologists that she was there to help them succeed.

An e-commerce project last year was a breakthrough, she says. During development, auditors discovered that some basic security policies weren't being followed. For example, there was no time-out to log off users after 10 minutes of inactivity, she says.

By catching the deficiencies early, auditors saved the team from having to go back and correct them at rollout — a harried time when no one wants to be told to start anything over. Being involved up front works best for both sides, Hogan says. "It's more of a partnership, rather than catching them in the act of doing something incorrectly."

One of the keys to overcoming the divide between IT and auditors is to educate the IT department about what an auditor's goals are in monitoring their work, says Greg Grocholski, one of 13 IT auditors at The Dow Chemical Co. in Midland, Mich.

Next, IT auditors must know the technology at all costs. IT experts don't want to be audited by people of lesser expertise, he says.

"If you're still viewed as the police, then you've done a poor job at marketing and informing others in the company about your mission," he says.

It's a never-ending process, though. In early 1998, after eight years in IT auditing at Dow Chemical, Grocholski encountered IT managers who questioned why auditors should be involved in the company's year 2000 remediation project. "They thought of us as technical

Why IT Auditors Stay in Business

Even at companies chosen by Computerworld *as the Best Places to Work in IT, projects slip. IT managers were asked what percentage of IT projects under their direction are completed on time and on budget.*

- 75% or greater
- 50% to 75%
- 25% to 50%
- 10% to 25%

Base: IT managers at 100 companies

SOURCE: COMPUTERWORLD RESEARCH, JAN.-MARCH 2000

The IT

Who's that looking over your shoulde
weathering derision and mistrust a

SHELLY HOGAN, a former IT auditor, says auditing works best when "it's more of a partnership"

auditors, not business auditors," Grocholski says.

It wasn't until after he had created and distributed a detailed plan for how his team would help Dow Chemical's Y2k efforts that the IT group agreed to work with the audit department, he says.

Company culture can also inhibit auditors from reporting serious dangers.

"Large IT projects tend to be associated with bonuses and promotions that people don't want jeopardized," says Webster.

He recalls a Fortune 100 financial services firm on the East Coast where the IT department used to boast that it was never late or over budget because it would redefine project parameters to meet whatever deadline was set. Then it would immediately start a follow-up project "to get the thing actually working," Webster says.

Some IT departments try to avoid formal audits with self-policing. The Earthgrains Co., a food distributor in St. Louis, does that, and it teaches IT managers to give a firm "no" when too many user requests will delay an application development project, says Stephen Brazile, Earthgrains' CIO.

The company has no internal IT auditors but relies on external monitoring from its accounting firm, PricewaterhouseCoopers. "If we don't finish on time, it's tough. You get a lot of questions from executive management," Brazile says.

At least 75% of Earthgrains' IT projects are on time and on budget, he says (see chart).

International Truck and Engine Corp. in Chicago doesn't have internal auditors, either. Art Data, vice president of IT, tries to keep the success rate for IT projects high by keeping them small. "The smaller we can keep [IT projects], the more chance you have to keep them on time and on budget. The bigger ones, we don't do as good a job," Data says.

Fifty percent to 75% of International Truck's IT projects are completed on time and on budget, he says.

Yet having an IT department monitor itself creates a conflict of interest, experts agree, because the work isn't done objectively with metrics that are independently verified. As Webster puts it, "You don't ask the software engineer 'How much do you think you have left? How good a job are you doing?' "

STANDING TOGETHER

Even if they're viewed warily, many IT auditors feel a kinship with the people they watch. They have a lot in common.

Pressure to do business on the Internet, for example, has forced IT organizations — and auditors — to work faster and learn about new technologies at a much quicker rate, says Jill Joseph, an IT auditor at Blue Cross/Blue Shield of Louisiana in Baton Rouge. Furthermore, Joseph says, online systems projects introduce many new areas for IT auditors to police, such as cybercrime and hacking.

"There's a whole set of different exposures out there," she says. "We have that learning curve to overcome, just like the IT folks."

IT Auditing: What It Takes

To be effective, IT auditors shouldn't report to IT managers or the CIO. They need to be independent of the people they're monitoring, says Bruce Webster, a director at PricewaterhouseCoopers in Washington.

Yet experience in IT can be invaluable, not only for the technology know-how, but also to ensure that auditors start off on the right foot with IT people, who may resent being watched over, Webster says.

Other must-do items for successful IT auditors include the following:

- Take courses to keep current on new technology.
- Get involved in IT projects at the start and help create achievable milestones.
- Publicize the criteria used to judge projects so that no one feels blindsided.
- Finesse political trouble by dealing with conflict artfully. Classes in negotiating and handling disagreements are critical.

–Kim S. Nash

Police

er? IT auditors monitor tech projects, mong technologists. By Kim S. Nash

KATHLEEN MELYMUKA/MS. MIS

Bridging a gap for women in IT

JILL ROSENTHAL had been tending bar for seven years when she realized she was going nowhere. Because she had an interest in art, she enrolled in a program in new-media skills sponsored by the city of San Francisco. "I've always been good at math," she says. "This was a chance to use that side as well as my creativity."

As the class progressed, Rosenthal found she liked programming even better. "I liked the problem-solving involved in writing code," she says.

Rosenthal was recruited for a job as a production assistant at the webzine *Salon* even before she finished the program. Today, she's saving to buy a house.

Lynn Garcia tried social work, odd jobs and volunteering before learning the skills to become a Web designer at *Upside Today*, an online magazine.

Both women are graduates of JobLink, a program from the Bay Area Video Coalition, a nonprofit media arts center. JobLink attempts to bridge the "digital divide," the chasm created as the rapid growth of the technology economy leaves many poor and minority communities behind.

Depending on which side of the divide you're on, you may see it as a major civil-rights issue of the new century or an unacceptable waste of potential talent for the already overstressed technology job market, in which 1.3 million new jobs will be created by 2006, according to the U.S. Department of Labor.

But any way you look at underemployment and untapped potential in the technical marketplace, you're looking at women.

More than half of JobLink's graduates have been women, and they've moved into careers as interactive designers, graphic artists, webmasters, site designers and HTML and Java coders. Many of these positions are more attractive to women than other technical jobs because they use technology as the tool in an endeavor that's basically artistic. Garcia, for example, who minored in art history in college, says the program's artistic element is what hooked her.

JobLink, which is free, consists of four months of intense, hands-on training: 45 hours on concepts like Internet basics, project management, design principles and Web design; 132 hours of techniques including digital imaging, HTML, text and graphics editing, digital video and audio, software tools, such as Photoshop, and JavaScript; and 103 hours of career development, from field trips to résumé writing, interview techniques and portfolio presentation. In the final phase, participants work on digital-video projects for area nonprofit organizations.

KATHLEEN MELYMUKA is a *Computerworld* feature writer. Contact her at kathleen_melymuka@computerworld.com.

Participants say the training is rigorous. "It's one of the more challenging and difficult things I've had to do," Garcia says. "But the rewards are immense."

For example, a 39-year-old African-American woman who made less than $16,000 per year before JobLink is now a Web producer pulling down $38,000. A 27-year-old Latina who made $5,000 is now a Web developer making more than 10 times that. Some participants report that they're even being recruited by other potential employers.

So far, JobLink has trained more than 220 people. Its placement rate has reached into the high end of the 90th percentile this year. Graduates are working for more than 30 employers, ranging from the San Francisco Museum of Modern Art and Charles Schwab & Co. to Big Zig and Planet Out Corp. JobLink succeeds where other programs fail because it targets the right people — over 25, low-income, English-speaking high-school graduates. It targets the right industry: new media. The culture is casual and favors productivity over credentials, it offers quick advancement based on results and freelance opportunities provide flexible working conditions for single parents and others who can't work full time. The program stresses real-world, project-based training. It has built relationships with employer companies, enabling JobLink to place graduates and to adapt based on client feedback, and it works with local community organizations for support services such as day care.

This year, JobLink won the best practices award from the U.S. Department of Housing and Urban Development. But more important, the program wins accolades from the women who have gone through the program. "I would recommend it to anyone," Rosenthal says. "It was the most intense, yet enjoyable, learning experience of my life."

A Change for Ms. MIS

We're confident that women in IT would agree that change is good. With that in mind, women's issues will share this space with the concerns of others who are underrepresented, underheard and underserved in IT. Hoping to advocate for a more diverse IT community, the new column, "DiversITy," will premiere Sept. 11. We hope to hear from all of you. ◗

CONFERENCES

■ INTERNET PRIVACY ePERSONALIZATION
Hyatt Regency San Francisco, Aug. 7-8
Explore privacy issues.
COST: $1,599
CONTACT: International Quality & Productivity Center, (312) 980-3413; e-mail: laplax@psinet
www.iqpc.com/INHP-TW/eprivacy&personalization2

■ CORPORATE PORTALS CONFERENCE
Boston Park Plaza Hotel & Towers, Aug. 8-10
Learn how to construct and maintain a corporate portal.
COST: $1,095
CONTACT: Digital Consulting Institute (DCI) in Andover, Mass., (978) 470-3880; e-mail: netreply@dciexpo.com
www.dci.com

■ WEB DEFENSE
Hyatt Regency Bethesda, Bethesda, Md., Aug. 8-9
How to implement and plan strategies to fight cybercrime.
COST: $1,895 to $2,795
CONTACT: Active Communications International in Chicago, (312) 780-0700; e-mail: jhaines@acius.net
www.acius.net/

■ LINUXWORLD CONFERENCE & EXPO
San Jose Convention Center, Aug. 14-17
Learn how to unleash the power of Linux.
COST: $795 for three-days
CONTACT: International Data Group in Framingham, Mass., (800) 657-1474; e-mail: linuxworldexpo@idg.com; fax: (508) 370-4325
www.linuxworldexpo.com

■ NETEXPO WASHINGTON 2000
The Washington Convention Center, Aug. 16-17
This conference will include content providers, Web developers, hardware and software suppliers, Internet service providers and firms offering e-commerce solutions.
COST: Free with preregistration by July 31 or $20 at the door.
CONTACT: NetExpo Washington in McLean, Va., (703) 536-2100; e-mail: info@netexpowashington.com; fax: (703) 536-2101
www.newexpo.com

■ SCO FORUM 99
University of California at Santa Cruz, Aug. 20-25
Provides the latest in e-commerce solutions.
COST: $995 for partners; $1,395 for general admission
CONTACT: The Santa Cruz Operation Inc., (800) 726-8649
www.sco.com/

■ SECOND ANNUAL NETWORK SECURITY CONFERENCE
Flamingo Hilton Las Vegas, Aug. 20-23
Provides information on how to secure your systems.
COST: $795 for ISACA members; $945 for nonmembers
CONTACT: Information Systems Audit and Control Association (ISACA) in Rolling Meadows, Ill.; e-mail: conference@isaca.org; fax: (847) 253-1443
www.isaca.org/nsc2000.htm

■ MIDDLEWARE: DEVELOPING AND INTEGRATING E-COMMERCE BUSINESS APPLICATIONS
Hilton Toronto Airport, Aug. 22-25
Provides education on middleware and how a business can use it to integrate different applications.
COST: $1,695
CONTACT: DCI, (800) 767-2755
www.dci.com/events/middleware

■ HELP TECHNOLOGY CONFERENCE
World Trade Center and Seaport Hotel, Boston, Aug. 23-26
Provides the latest information in online help design and development.
COST: $995
CONTACT: WinWriters in Seattle, (800) 448-4230
www.winwriters.com/htc.htm

Structured Financing

DEFINITION

Structured financing offers an opportunity for a company to borrow money based on the value of a specific project or asset, rather than on its own credit rating. For example, a company building a factory can borrow money based on the worth of that factory or on projections of future revenue from that factory.

BY MARIA TROMBLY

"JOE" WANTS TO buy the equipment needed to become an Internet service provider. He has customers signed up and knows he'll have a predictable revenue stream. But Joe has no credit history and no track record.

In the event that he can't get a business loan or venture capital, there's another financing option that could work for Joe: structured financing, which is a way of borrowing money against an asset or a projected asset without consideration of the creditworthiness of the borrower.

"If you had a fairly stable stream of revenues coming in once you built out the infrastructure, that's a very likely candidate for structured financing," says Todd Eyler, an analyst at Cambridge, Mass.-based Forrester Research Inc.

For example, a good candidate for structured financing, he says, is a company or government agency that's building a bridge — an asset with a lasting and fixed value. If anything happened to the borrower, the bridge would still be there.

This kind of financing is ideal for a start-up company that needs a lot of capital to get going but doesn't have a good credit history, Eyler says.

Structured financing isn't intended for small-scale projects: The average size of a structured financing deal is $25 million, and it can top $300 million or more, according to Kevin Walsh, managing director of the Structured Finance Group at General Electric Capital Corp. in Stamford, Conn.

"If I have to buy equipment or machinery, an efficient way to finance that would be through structured finance," Eyler says. An existing company would be more likely to use structured financing to smooth out its cash flow, he adds.

For example, a movie studio that hires Mel Gibson to star in a film has a huge up-front expense — namely, his salary. But there's also an almost guaranteed revenue stream from theater tickets, foreign distribution, video sales and television rights.

Eyler warns that most technology investments don't readily lend themselves to structured financing because they tend to depreciate too quickly. Plus, the revenue stream for many information technology projects, including e-commerce, is too uncertain, he says.

"Purely lending against IT infrastructure itself — that's a recipe for disaster," Eyler says. "If I were a bank, I wouldn't focus a lot of my balance sheet on that."

Like Rent-to-Own

Ironically, one of the very first instances of asset-backed borrowing was when Sperry Rand Corp., now part of Blue Bell, Pa.-based Unisys Corp., used structured financing for its computer equipment in the mid-1980s, according to David Warren, an analyst at New York-based Morgan Stanley Dean Witter & Co.

Equipment leasing is a form of structured financing that's similar to the "rent-to-own" financing model used by some furniture stores. In this instance, the finance firm buys the equipment and leases it to the company that needs it.

GE's Structured Finance Group does a lot of this, according to Walsh.

"We are the tax and legal owners, and the ownership would revert back to [the user of the facility] at the end of the lease agreement," Walsh says.

Why would a company adopt this type of structured financing? One reason is the tax advantages, Walsh says.

For example, if a company has an asset that represents a tax credit, the credit is unrealized if the company is losing money. By transferring the asset to a firm that can take advantage of the credit, everyone comes out ahead — except that Uncle Sam has to give the credit earlier than otherwise might have been true.

Another reason to lease equipment instead of owning it outright is to make the company look more attractive to Wall Street. Although equipment and facility leases must be mentioned on corporate financial statements — usually in footnotes — they wouldn't show up in things like leverage ratios, which is the amount of debt vs. equity, according to Eyler.

"The bottom line is that companies are trying to optimize their capital structure," Walsh says. "Depending on where it is in its growth curve, [the company] may need more equity or more debt."

Another type of structured financing involves equity, or partial ownership of a company.

For example, Walsh says, his group would lean toward taking an equity investment in a telecommunications company that wants to expand. Why? Because a company may want to have less debt and more equity and because GE Capital likes to invest in growing companies. "We want to grow with the company as it grows," Walsh says.

Say that a telecommunications company secures a license for a new region and needs to build its infrastructure, he says.

Usually, Walsh will deal with a company's CEO and chief financial officer, and a chief technology officer is integrally involved as well, he says.

"We have on our staff a whole cadre of engineers and so forth that help us assess projects like that and help us assess the risks and the valuations," he says. "They would be talking directly to the CTO to discuss these issues."

Benefits of structured borrowing:

- A company doesn't need a track record or a good credit rating to borrow money for worthwhile projects.
- If money is tight, but is expected to become more available, a company can borrow against future revenue and even out its cash flow.

Benefits of structured finance leasing:

- Keeping a large asset and a large loan off the balance sheet can make a company look better to analysts.
- Occasional tax advantages: If the financing firm can use tax breaks that would otherwise go to waste.

Benefits of convertible preferred equity:

- Can be used to adjust the proportion of debt on a company's balance sheet.

Financing Firm Launches Online 'Deal Room'

General Electric Capital's Structured Finance Group handles complex financing deals that can take up to six months to process.

But there might be a way to cut that time by 10% to 20%, says Kevin Walsh, the group's managing director of e-business.

Two months ago, the company launched an "e-deal" room, which is currently being used to manage 35 deals across various industries.

"We think this is a terrific way to transform a complex and cumbersome deal-making process," Walsh says. According to Walsh, 10 to 12 people are usually involved in a deal. A telecommunications equipment build-out, for example, can take months of assessment, evaluation, contract development, lease structuring and pricing. Once a deal is struck, large amounts of data continue to move between the customer and the financing group.

The Structured Finance Group Web site (*www.ge.com/capital/sfg*) also hosts tools, such as an oil and gas reserve calculator that can be used to estimate the worth of an oil or gas property.

Currently, the project collaboration tools are provided by an outside vendor. However, Walsh says his group is in the process of building its own tools, which are expected to be online by the fourth quarter.

About one month ago, one of GE Capital's oil and gas industry customers began piloting an automated reporting package that's expected to remove 10% to 20% of the costs of monitoring and complying with loan documents. Additional customers are expected to join in the next few weeks.

– *Maria Trombly*

■ *Are there business terms you would like to learn about in QuickStudy? Please send your ideas to quickstudy@computerworld.com.*

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Dear Career Adviser:

I'm a risk and credit analyst at a Fortune 500 company. I was recently given the opportunity to devote approximately 30% of my time to developing our business unit's e-business strategy and initiatives. I love working on e-business issues and want to do it full time. I've got a good business background, but I feel like I need to develop my technical skills. How should I go about this? What skills should I be focusing on? What's the best format for developing them? — E-BUSINESS INITIATIVE

Dear E-Biz:

You don't necessarily have to become a hands-on techie, but you must become tech-savvy enough to ask the right questions.

Can you look at various technology choices and platforms, such as Webridge vs. Commerce One, and understand the implications, rewards and risks of each, as well as why one system is selected and another isn't? That's the level of learning "granularity" you'll need.

So while you won't need to learn to program in Java, New York-based recruiter John Bongiorno advises that you dig deep into e-commerce software, tools and implementations. "Learn to understand the different versions of software and the different tools available so you can see not just the differences between a product upgrade — e.g., Oracle7 vs. Oracle8 — but the actual differences in the product itself," says Bongiorno, CEO of Myrecruiter.com.

Given this input, your best career choices are either in business development, where you'll be developing your employer's electronic-business strategy, or in product management, where you'll be organizing a project, making sure development goals are met and acting as an intermediary between the technical and business staff.

For either route, start by working at a company that can provide you with a good mentor to upgrade your technical skills, where you'll start by learning the right questions to ask. Learn to understand what the technology means relative to the business goals you're trying to support at a deep, specific level.

Dear Career Adviser:

Everything you write about emphasizes Java and Oracle rather than Microsoft Active Server Pages, SQL Server and Windows NT for future career growth. Do you think Microsoft-related technologies are becoming less important, particularly for Internet-related developer careers? — MICROSOFTIE

Dear Softie:

Not at all. It all depends on whether your choice is to join the developer community using Windows, SQL Server or Visual Studio. The latter certainly offers well-respected technology for e-commerce applications and is used for Web initiatives at companies such as Ask Jeeves, Stamps.com, Buy.com, Barnesandnoble.com, Dell Computer, J. C. Penney, Ticketmaster and many others.

If you choose the Microsoft path, take the advice of Barry Goffe, group manager for Windows Distributed Internet Applications Architecture at Microsoft.

FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

"Most high-end e-commerce applications are built with Visual Studio, using a combination of Visual Basic and Visual C++," says Goffe. "Visual Basic allows people to rapidly build complex business components and Visual C++ allows people to build the highest-performance business components possible.

"Moreover, Microsoft recently introduced yet another development language known as C#," he adds. "It offers better productivity for C and C++ developers and is a language optimized for Internet application."

More About DBA Opportunities

In my June 5 column, a Sybase database administrator asked about opportunities as an Oracle database administrator (DBA). Reader Krishnamuirthy Iyer wrote in to offer an alternative career path.

"I would suggest instead that the professional move to [Microsoft] SQL Server DBA, which is in great demand currently," Iyer says. "Many corporations are choosing this database for lower-volume database usage and for Web applications using [Active Server Pages]. Moving into MS SQL Server will be a breeze, as essentially both the products have evolved from the same engine. This is similar to another current trend of C++ programmers moving to Java."

While ease of transfer is a great boon, Stormtech Search LLC's Kerry Morris, a recruiter based in San Francisco, says there are a few things you should be aware of before making this move.

"I probably get about 10 times the number of job openings for companies needing Oracle DBAs, but there are not as many candidates for MS SQL jobs," says Morris. "As MS SQL DBAs are harder to come by, companies using MS SQL are willing to pay for them, but there are more e-commerce jobs using Oracle."

BRIEFS

Agillion Teams Up With Office Depot

Office Depot Inc. in Delray Beach, Fla., and Agillion Inc. in Austin, Texas, announced that they will jointly market their online products and services for small businesses. Agillion will offer its management services through Office Depot's Web site and catalog. Agillion's technology lets small businesses create Web pages that can be personalized for each of their customers.

Yahoo Posts Gains

Yahoo Inc. last week posted stronger-than-expected financial results for its second fiscal quarter, as well as a sharp increase in traffic to its Internet sites. Excluding acquisition-related charges and other unusual items, second-quarter net income was $73.9 million, or 12 cents per share, compared with $27.1 million or 5 cents per share one year ago, the Santa Clara, Calif.-based company said. Analysts had expected the company to report a profit of 10 cents per share, according to First Call/Thomson Financial in Boston. Reported revenue for the second quarter, which ended June 30, was $270.1 million, an increase of 110% from $128.6 million one year ago.

IBM Buys Aragon

IBM announced last week that it has acquired Aragon Consulting Group, a market research and strategy firm in St. Louis. IBM said the acquisition will help it provide the entire spectrum of electronic-business services, from Internet strategy and marketing services to back-end integration. Financial terms of the acquisition weren't disclosed. Aragon's specialty areas include research, market segmentation, new product development and brand positioning. The company's U.S. customers include the *Chicago Tribune* and Bank of America Corp.

Pinkerton Names VPs

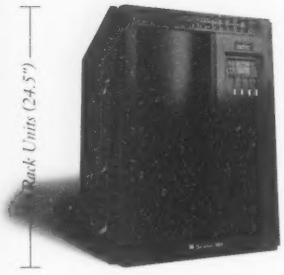
Pinkerton Computer Consultants Inc. in Trevose, Pa., announced the appointment of Bob Burton as vice president and general manager of its southeast region. Burton comes from CACI International Inc. in Arlington, Va., where he was vice president in charge of logistics and corporate business development. Pinkerton also announced the promotion of Joseph Chrisinger to vice president and group manager. Chrisinger was serving as project manager of information technology services for the Federal Deposit Insurance Co. at Pinkerton before his promotion.

ADP Adopts Polite Messaging System

Roseland, N.J.-based Automatic Data Processing Inc., which provides systems and communications networks for 18,000 auto dealerships in the U.S. and Canada, has selected San Jose-based BackWeb Technologies Inc.'s Polite software to keep its members informed of products, pricing, promotions and training programs. The Polite software provides Internet-based applications and proactive portals that allow users to send information whenever network bandwidth is available, without disrupting other network activities.

Excite Helps Set Up Shop

At Home Corp. in Redwood City, Calif., is offering a service called Freetailer that lets anyone with an Internet connection create a business Web site. Once users sign on at *www.freetailer.com*, all services are free for the first 100 business transactions. After that, users are asked to upgrade their sites and begin paying monthly fees. There is no time limit on the first 100 transactions, so users can return to their online businesses after a lapse without charge.



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TECHNOLOGY

BETTER FLIGHT TRACKING

The FAA plans to adapt an air-traffic control system from either Australia or New Zealand to control all U.S. oceanic airspace. If it works, the system could save airlines millions of dollars through reduced flight times and more efficient routes. ▸ 58

NAPSTER GAFFE

Last week's Hack of the Month on security vulnerabilities in Napster missed some important points, but the music trading program can still pose a security threat. Deborah Radcliff makes the mea culpas and clarifications. ▸ 58

NOT ALARMING

When is too much information a bad thing? When you get so many alarms from monitoring tools that it's hard to bring business-critical applications online. Concord Communications has released a tool it claims combines network, systems and application monitoring in prioritized reports. ▸ 60

TRUST NOBODY

Your application service provider or Web host will take care of chores like backing up files, right? Wrong, say some customers and analysts. If your data or your site is important, have a backup ready. ▸ 61

EXEC TECH

Some simple yet amazing technology is hastening the time when electronic whiteboards will be embedded in office equipment and the scribbles we produce with them will be shared routinely over the Internet. ▸ 62

QUICKSTUDY

Programming languages are the sets of keywords and systems of rules for constructing statements that humans can use to communicate instructions to a computer. ▸ 64

FUTURE WATCH

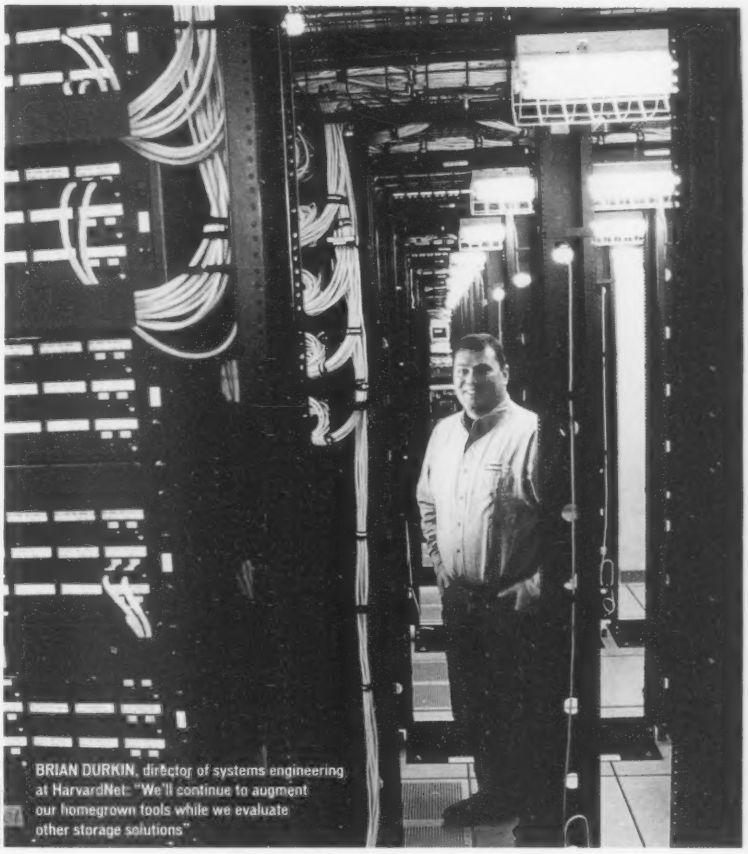
A battle for the market in delivering new types of paid content is looming. In one corner: PCs, WebTV, inexpensive Web-surfing appliances and companies trying to decide how and when television and the Internet will converge. In the other corner: Sony, and a machine ostensibly built to play games. ▸ 66

EARLY WARNING

Boeing's research unit has two jobs: to "make sure something doesn't sneak up on" the company and to develop technology such as computers that predict how a part will feel before it's built. ▸ 70

EMERGING COMPANIES

Start-up Rainfinity's software aggregates firewall, Web and other Internet servers into a single cluster for improved performance and reliability. It's a more efficient solution than throwing hardware at the problem. Will IT managers bite? ▸ 73



BRIAN DURKIN, director of systems engineering at HarvardNet: "We'll continue to augment our homegrown tools while we evaluate other storage solutions"

HOMEGROWN STORAGE TOOLS

MANY IT PROFESSIONALS who manage high-end storage are looking for turnkey management tools but aren't finding exactly what they need. Their answer to the problem is to develop tools of their own to ride herd on important functions such as load balancing, capacity optimization, storage quota management and server availability.

68

FAA Looks Abroad for Air-Traffic Control Systems

Agency may replace outdated U.S. system with technology from down under

BY BOB BREWIN AND MICHAEL MEEHAN

THE FEDERAL Aviation Administration (FAA) has begun its on-site evaluation of technology from down under that it hopes will lift U.S. pilots into the 21st century.

The FAA currently uses technology developed in the era of propeller-powered Pan Am Clippers to guide jets across the Atlantic and Pacific oceans. Air-traffic controllers plot the movement of planes on paper, relying on position reports sent in by pilots over noisy and unreliable high-frequency voice radio systems.

But once suitably equipped trans-Pacific aircraft reach Australia- or New Zealand-controlled airspace, air-traffic controllers in those countries easily track inbound fights on large "pseudo radar" screens. Those screens display moving aircraft icons positioned with precise location information derived from onboard Global Positioning Systems (GPS) sent to advanced air traffic control (ATC) systems operated by Airservices Australia in Canberra or Airways New Zealand in Auckland.

THE FAA may use Australia's air-traffic control system to manage U.S.-controlled oceanic airspace

The FAA, which has struggled since the mid-1990s to upgrade its oceanic air-traffic control systems, has decided to adapt either the Australian or New Zealand system to suit its needs. Earlier this month, an FAA team began its technical evaluations.

Arinc Inc. in Annapolis, Md., has teamed with Airservices Australia to adapt that country's system for use in FAA oceanic ATC centers in Oakland, Calif., and Anchorage, Alaska, for Pacific flights and in New York for Atlantic flights. Arinc and Lockheed Martin Corp. in Bethesda, Md., in partnership with Airways New Zealand, will submit bids to the FAA in November. A contract is expected to be awarded by year's end, with installation planned for Oakland by the end of next year.

Potential Savings

The airline industry has been impatiently waiting to capitalize on the capabilities of cockpit-based Future Air Navigation Systems (FANS), which consist of flight management computers, GPS receivers and satellite communication systems. Airlines can save "significant sums of money" by flying FANS routes, said a flight operations manager at a large U.S.-based cargo carrier, because the systems provide greater flexibility in choosing routes, thus cutting down flight time.

This manager, who spoke anonymously, said his company could save $20 million to $24 million a year in fuel and crew time if FANS could shave 45 seconds off the flight times for the 12 to 14 Pacific trips the cargo carrier runs per day.

Controllers and the flying public will benefit too, said Bill Blackmer, director of safety and technology at the Washington-based National Air Traffic Controllers Association. "We still have controllers working aircraft with little pieces of paper. ... [Oceanic] position reports are not displayed, which means controllers have to [visualize] it all in their brains," Blackmer said.

Airservices Australia and Airways New Zealand — the counterparts of the FAA in those countries — use a technique called Automatic Dependent Surveillance to track and display flights, according to Bob Peake, project manager for Airservices' Australian Advanced Air Traffic System.

He said the information in the visual display makes it far easier for a controller to provide flexible flight routings — which is key to helping aircraft avoid head winds and ride powerful tailwinds.

DEBORAH RADCLIFF/HACK OF THE MONTH

Napster gaffes

AS SOON AS last week's Hack of the Month column appeared [Technology, July 10], in came a flood of e-mail claiming I had overstated the threat and was just plain wrong on some important points. Well, I was wrong on some points and had been given incorrect information about others. But I stand by my central point that Napster Inc.'s software poses some important threats for corporate users.

Last week, I reported that "Sinister Geek" could trick a Napster client into sending non-MP3 files when the hacker also used a wrapping tool called Wrapster. Bruce Hubbert, director of West Coast operations at IFSec Inc., a security consulting group in New York, told me he had done exactly that. Outside sources verified that, because Napster provides no authentication or encryption when downloading files, there is a threat.

However, I did make some mistakes. The first is how the attacker would exploit the Napster client. One reader said Napster can upload MP3 files only from directories selected by the Napster users. He's right — unless a hacker uses a buffer overflow (confusing command buffers with unacceptably high numbers the client PC can't understand) to trick Napster into displaying file directories it shouldn't, Hubbert says.

The second error is that, contrary to what I wrote, Wrapster can't be executed remotely by an attacker. Wrapster must already be installed on the hard drive of the user, by the user.

Hubbert acknowledges that it would take the installation of a Trojan horse such as Black Orifice to get Wrapster to do a hacker's bidding.

And as one reader said, once you get a Trojan horse in the victim's machine, why not just find an easier way to ship data out, such as exploiting Outlook? This is the part of the supposed threat Hubbert acknowledges is theory: "I did not actually manipulate Wrapster to ship data off the test machine. But I did buffer-overflow Napster to show me file directories it shouldn't have."

DEBORAH RADCLIFF is a *Computerworld* staff writer who specializes in security. She can be reached at deborah_radcliff@computerworld.com.

A final error suggested that Napster automatically logs the speed at which the client PC is linked to the Web. In fact, whoever downloads Napster has control over the connection speed recorded at the Napster site.

Hubbert and other security professionals say Napster is still a security threat. He also denies having any hidden agenda against Napster.

"You can transfer files with a Napster client," says Hubbert. "There's no authentication. No encryption. And the code isn't open source, so you can't really be sure what it does. I already proved it's vulnerable to buffer overflows, which is a very common problem in most client software."

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Live Health Tool Aims to Streamline Management

BY GAMI LAIS

Concord Communications Inc.'s Live Health reporting tool, released last month, will filter extraneous alarms and show information technology managers current network, systems and application monitoring data in a historical context, said a company spokesman.

Just a reminder the next time you're considering a Web procurement solution.

"The Microsoft platform leads two-to-one over its closest competitors, IBM and Oracle, in Web procurement solutions currently in use."

—Zona Research, Inc.
Q1 2000 eProcurement Study.

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Live Health combines real-time and historical data, filters it to reflect the performance of all the applications and other IT systems needed to perform specific business processes and then produces reports for managers who monitor all three IT areas, said Kevin Conklin, marketing vice president at the Marlboro, Mass.-based company.

"Live Health [runs on] Solaris and does what we were looking for — statistical analysis of network traffic," said Todd Whipple, an internetworking specialist at Canada's Department of Foreign Affairs and International Trade in Ottawa.

Live Health is a combination of Concord's own Network Health reporting tool, its recently acquired real-time monitoring and reporting tool from First Sense Software Inc. and its recently acquired system and application management tool from Empire Technologies Inc.

Such merging of management data reflects a long overdue trend, according to Dennis Drogseth, an analyst at Enterprise Management Associates Inc. in Boulder, Colo.

Going further and filtering out extraneous data should help managers, said Paul Bugala, an analyst at International Data Corp. in Framingham, Mass. "It's hard to staff a network operations center," he said, "so anything you can do to simplify things is good."

The trade-off, Bugala said, is that "with Concord, you're not going to get help desk and the other functionality you get with a mature product like Tivoli Management Enterprise."

But Live Health's filtering capability may be the software's most useful feature, said Joe Banks, a senior network engineer at Wang Government Services Inc. in McLean, Va.

It lets a user "see only the exceptions you want to see — a particular router or LAN link," he said.

For example, if a router slows, "every computer that touches it will send an alarm," said Elizabeth McPhillips, an analyst at Probe Research Inc. in Cedar Knolls, N.J.

Live Health presents the duration rather than the number of alarms, thus "eliminating the network traffic all those alarms would have generated," McPhillips said.

When Live Health polls devices, "it's not taking all Simple Network Management Protocol [SNMP] traps, just very particular [Management Information Base] variables," said Bugala. "Leaving some [extraneous data] out cuts down on traffic."

> Live Health [runs on] Solaris and does what we were looking for — statistical analysis of network traffic.
>
> TODD WHIPPLE, INTERNETWORKING SPECIALIST, CANADA'S DEPARTMENT OF FOREIGN AFFAIRS AND INTERNATIONAL TRADE

Live Health aggregates monitoring data from San Francisco-based Micromuse Inc.'s NetCool and OpenView Network Node Manager from Hewlett-Packard Co. and accepts SNMP data from sources other than its own polling agents, Conklin said.

"You'll still need something like NetCool or OpenView to get the operational view," Bugala said.

Both Wang and the Canadian foreign affairs department also use HP's OpenView Network Node Manager.

"There's no one universal product for everyone," Drogseth said. An enterprise's size, complexity and goals affect its choices of tools, he said.

Other Options

A similar management package could combine tools such as NetScout from NetScout Systems Inc. in Westford, Mass.; Spectrum from Aprisma Management Technologies in Durham, N.H.; and VitalSuite from Murray Hill, N.J.-based Lucent Technologies Inc., Drogseth said.

"I would dare to say that [Nortel Networks Corp.'s] Optivity or Cisco's NetFlow or others can provide some or all of what Live Health does," Whipple said.

"It's the only one I've seen that's showing this view in this way," McPhillips said. "And Live Health is very intuitive. You can get the information in other products, but it's a bit of a trial."

Pricing for Live Health, an add-on to Concord's Network Health, starts at $35,000.

Live Health

How the data flows:

- EHealth SNMP agents collect real-time performance data and feed it to Live Health.
- Live Health calculates the amount of time a threshold has been exceeded and what its deviation from normal is before generating an alarm.
- An alarm, with drill-down data, is presented in one report and in the context of historical data from Live Health, HP OpenView or Micromuse NetCool.

Verio Outages Point Out Customer Need for Backup

BY JENNIFER DiSABATINO

Before trusting your data and your Web site to an application service provider or Web hoster, make sure you've got a backup plan.

That's the advice from some analysts and users after thousands of e-commerce sites were taken off-line and some destroyed altogether by unrelated outages at two Verio Inc. data centers.

While Englewood, Colo.-based Verio is a large player in this space, businesses and analysts agree that the size of the company is no guarantee of service.

Bob Zimmerman, an analyst at Giga Information Group Inc. in Cambridge, Mass., said customers should carefully check their contracts with service providers.

"If you're not making [backups] a contractual requirement and periodically demanding proof . . . then you, as a corporate officer, are negligent," said Zimmerman.

In some jurisdictions, data is considered as much an asset as a factory, Zimmerman said, and a company may have legal recourse to recover damages in much the same way it would if one of its capital assets were destroyed.

No Guarantees

The contract, however, doesn't always guarantee protection.

"Having seen a number of vendor contracts," Zimmerman said, "I would bet next week's salary if you signed a vendor contract, it says he's responsible for nothing."

While large companies and resellers may have the leverage to demand guarantees, Zimmerman said, "probably the little guy is going to lose out."

Many companies go with an application service provider (ASP) to cut costs and headaches, but protecting their data or their Web sites may be worth the cost of having backup plans, said Rich Ptak, an analyst at Hurwitz Group Inc. in Framingham, Mass.

"If it's a significant revenue source, [customers] should look at themselves or a backup supplier" to keep a site up if an ASP or Web hoster fails, Ptak said.

It's shortsighted to expect Verio and other similar companies to take the sole responsibility for a company's backup, said Randy Kerns, an analyst at Evaluator Group Inc. in Englewood, Colo.

A Look Under the Hood

When looking under the hood of an ASP, uptime is a key indicator of performance, said an executive at software vendor Legato Systems Inc.

While an ASP may tell you that it has 99.99%, or even 99.999%, uptime, that doesn't necessarily tell the whole story, said Frank Sowin, director of the service provider business unit at the Mountain View, Calif.-based company.

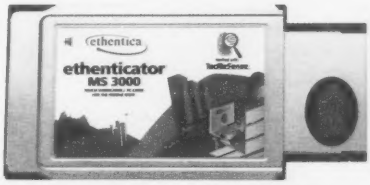
That's because uptime "does not measure application response time. It doesn't necessarily measure application availability. It does not measure server availability, and so those are all important," Sowin said.

Get Your Backup

When you leave your data in someone else's hands, there may not be much you can do to protect it. But the experts say there are some precautions you can take to make sure your Web hoster or ASP is doing its job:

- **Check your contract.** Make backup part of the contract, and know if your provider guarantees your data.
- **Contract with two ASPs.** You may be able to arrange for one to be a backup.
- **Have an emergency backup.** For example, you could get a cheap, Web-based e-mail account to keep in contact with the outside world if your site and e-mail go down.

TALK ABOUT YOUR HANDHELD SECURITY . . .



How do you absolutely protect a notebook computer from hackers? One way is with a biometric Type II PCMCIA card (shown) with a pop-out fingerprint sensor. The Ethenticator MS 3000 can eliminate the need for passwords, the company says, by allowing access to Windows applications or Web forms only if a user's fingerprint matches a stored image. The card is now shipping for $199 from Lake Forest, Calif.-based Ethentica Inc. (*www.ethentica.com*).

Ethentica is also planning pilot implementations of the card with companies such as CompuCom Systems Inc., Amdahl Corp. and The Fijitsu Group. The card is driven by SecureSuit, a group of security applications that includes the SecureStart software needed to perform fingerprint recognition.

"Many companies have promised biometric products like this," says Ethentica CEO Doug Antone. "But ours is the first that actually works, is commercially acceptable and at the right price point."

–Jennifer DiSabatino

Just a reminder the next time you're thinking about which OS to use in the new economy.

Of the secure e-commerce sites conducting business, 52% run on Windows*, while only 11% run on Sun.

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The Traveling Whiteboards

BY DAVID ESSEX

IT SEEMS SILLY TO TALK about the "installed base" of whiteboards or to wonder about the etiquette of capturing information from whiteboards that aren't yours. But some simple yet amazing technology is hastening the day when electronic whiteboards will be embedded in office equipment and the scribbles we produce with them will be shared routinely over the Internet.

MIMIO 1.1
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What will enable this is, in large part, the arrival last year of two products that took electronic whiteboarding to a new level of portability: Mimio, from Boston-based Virtual Ink Corp., and the slightly newer and smaller eBeam, from Electronics for Imaging Inc. (EFI) in Foster City, Calif. Both are small, lightweight devices that fit into a carry-on bag or notebook case and can be attached to almost any whiteboard temporarily, letting you save board markings electronically.

Prior to the release of Mimio, an electronic whiteboard was considered portable if you could wheel it into a conference room. Those big units, typically costing $1,000 to $3,000 and often called copyboards, normally print out information on fax-like thermal paper (though some work with standard paper) and can download data to a PC. More sophisticated color whiteboards use pressure-sensitive technology similar to that of digital tablets to pinpoint pen position; they're about twice as expensive as copyboards. So-called whiteboard features in remote conferencing software like Microsoft Corp.'s NetMeeting and videoconferencing systems are geared toward one-on-one communication and require mouse or pen-and-tablet control — hardly a real-world whiteboarding experience.

With 16 million whiteboards installed in offices (according to Virtual Ink), odds are you can use the eBeam or Mimio capture devices while traveling, without having to tote your own board. Is it rude to pull out a Mimio and put it on someone else's board? Probably not if you ask first, talk about your toy and promise to share the resulting file.

EBeam and Mimio separate the capture mechanism from the board surface. They use infrared light to recognize the activation of special pens and ultrasound to locate their positions. The bulky pens contain transmitters, and standard erasable markers slip inside.

Both companies say separating out the capture technology will allow for the development of all sorts of clever whiteboard devices in the near future. They'll be easier to build into rooms because the two main components will be less expensive individually and will be able to be paired for less than it costs to buy all-in-one whiteboards.

What You Get

The two devices differ physically far more than they do technically. Besides having a smaller, two-piece sensor, eBeam's markers are somewhat thinner and easier to handle. But eBeam requires an AC adapter, and it sacrifices some onboard control by not having any room for buttons on the sensors. It makes up for this in part by providing a virtual control pad, called a shortcut strip, that lets you start new pages and print pages by tapping on the board.

EFI claims that the two watch batteries inside each eBeam marker last longer than its competitor's single AAA battery per stylus, but I couldn't verify this.

Mimio's sensor hardware isn't nearly as compact as eBeam's, but it uses the extra real estate to add more onboard controls for starting and printing boards, "tagging" boards so they can be inserted into session files and activating a virtual control pad that's far more versatile than eBeam's (and even includes a calculator).

Its electronic eraser has both a narrow pad and a wide pad, which I prefer to eBeam's single eraser. Its capture bar gets power from a more convenient adapter that plugs into the PC keyboard connector. Both units plug into a PC's serial port and have optional Universal Serial Bus adapters.

I tried both products, and I had to struggle a bit with both to get them to recognize all my marker strokes. The key, I found, is to press down hard and consistently enough to keep the pen's transmitter activated throughout the stroke.

The software for both programs provides the kinds of controls you might expect would accompany electronic capture, letting you adjust for different-size whiteboards or alter the electronic image, for example. Both have playback features that let you press tape-recorder-style buttons to move back and forth through individual marker strokes (but eBeam can't jump whole pages like Mimio can). The companies say this feature is helpful in reconstructing the sense of a meeting because it can remind you of the order in which items were written.

Overall, eBeam's software isn't as feature-rich as Mimio's. It does, however, support live group conferencing both natively and through NetMeeting. Mimio requires NetMeeting on the sending side for its conferencing function, but this feature was recently upgraded to allow NetMeeting users to view whiteboards without needing Mimio software.

Mimio also comes with handwriting-recognition software from San Jose-based Vadem Inc.'s ParaGraph division. I found its recognition rate to be poor, probably because I couldn't get Mimio to reliably capture marker strokes.

While I found both products fun and useful once I got the hang of them, I prefer eBeam by a slight margin because its two soap-bar-size sensors are more portable and seem sturdier than Mimio's single retractable bar; it also captured strokes more reliably. Mimio is a comparable value that's helped by its superior feature set, but I found it less reliable and somewhat inconvenient to handle. Either device would serve well anyone who regularly conducts meetings and ad hoc presentations on the road.

Essex is a freelance writer in Antrim, N.H.

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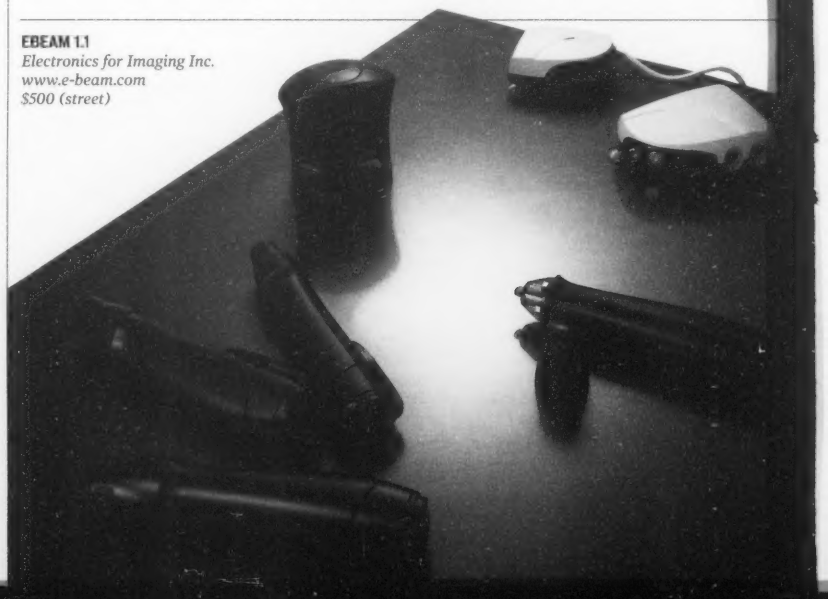

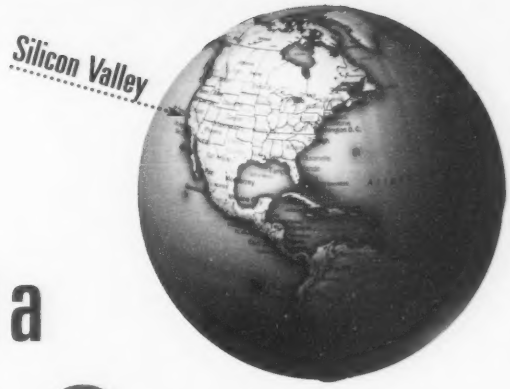

It's Not Just a Dot.Com World

Look Beyond The Valley

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Programming Languages

DEFINITION

A programming language is a set of keywords (the vocabulary) and a system of rules (the grammar or syntax) for constructing statements — consisting of groups or lines of numbers, letters, punctuation marks and other symbols — by which humans can communicate a set of instructions to be executed by a computer.

BY RUSSELL KAY

DUMB — that's the only word to describe computers, because they know only two things: zero and one. But they manipulate those bits so quickly, they can accomplish useful tasks. In fact, some early computers were programmed by setting sequences of ones and zeros on front-panel switches.

That's clearly the low point in user-friendliness and inefficiency. Programming languages were created to give us humans a chance to understand what it was we were telling the computer to do.

Programming languages incorporate several important ideas. They abstract operations into a form that's more like the way people think, which makes programming easier. To divide one number by another is a simple concept that we express in a couple of symbols, but to a computer, that same task takes dozens of small operations.

In addition, programming languages let us give meaningful names to things like variables and constants, which makes programs easier to create, understand and troubleshoot.

At the lowest level, the zeros and ones of machine code aren't really a language at all. The earliest true language was assembler, and it was different for each type of computer. Assembler used abbreviations for common operations (such as ADD, MOV, JMP), with each followed by the address of one or more parameters. Recognizable names replaced numerical addresses, and the resulting programs were far easier to work with. Assembler is called a low-level language because it gives complete access to a computer's basic instructions. It's still used for some routines when it can produce more efficient code than other languages.

Different Strokes

But how could you make a program run on two different computers? You would have to reprogram it for the second machine's instructions. The answer was a higher-level language that could be adapted to different computers by processing the application code through another program, known as a compiler, which translated the application into machine code and stored it as a file. Or it could be done through an interpreter, which did the same job as a compiler on the fly and then ran the program without storing it. The compiler or interpreter was specific to each computer type, but it needed to be created only once and could then process many programs written in the high-level language. The first important language like this was Fortran (short for "Formula Translation"), which is still used by scientists and engineers.

AT A GLANCE

Just Do It!

Whatever the design or look, languages allow programmers to use the following elements:

Sequential operations: After executing one instruction, the machine goes to the next.

Loops: Execute a sequence of events over and over until some condition is satisfied.

Comparisons and branches: Depending on the value of a given variable or register, the computer either executes the next instruction or instead branches, or jumps, to a different place within the program.

Proliferation

Thousands of programming languages have been devised, but only a few are in common use (see "A Linguistic Sampler"). Various organizing principles underlie these languages:

- To simplify and streamline the handling of specific types of information, such as strings of characters (Snobol), matrices (APL), logical expressions (ProLog) or databases (SQL).
- To facilitate certain styles of programming, including programs that nonprogrammers could hopefully understand (Cobol, Basic), very large programs (Ada), object-oriented programming (Eiffel, C++, Java, SmallTalk) and visual programming, where the user relates icons to one another and uses property sheets to describe their interaction (Salsa, Visual Basic, Visual C++).
- To simulate a theoretical or real-world situation involving random events (Simula, GPSS).

In addition, languages can be described as procedural (executing in a given order, depending on the data), event-driven (they sit there until something happens and then respond) or cyclical (repeatedly executing a fixed cycle of operations).

Many programming languages are now historical footnotes (Algol). Others are strongly identified with specific areas: business (Cobol, RPG), computer science and artificial intelligence (Lisp, ProLog), teaching how to program (Basic, Pascal), systems software (C, C++), the Web (HTML, Perl, Tcl) and publishing (SGML, PostScript).

Some languages were designed to be interpreted not by the computer but by another application. These are called scripting (Visual Basic Script, JavaScript) or macro languages (Rexx, HyperTalk).

Programs aren't necessarily restricted to a single language. Most large programs incorporate routines, libraries, functions and other types of program segments that have been created using different languages. In fact, it isn't necessary to know what that original language was.

Finally, the Web has sparked a whole new spectrum of programming languages. HTML and Java are the universal languages of the Web. Tcl is the underlying language for *www.computerworld.com*. Java was developed for the Internet, and Microsoft has announced its newest language, C#. ◗

A Linguistic Sampler *(entries in red are more widely used)*

NAME	DEVELOPED	PRIMARY USE	COMMENTS
ADA	1980-83	General apps	Used by DOD
Algol	1958	Scientific	
APL	1960s	Scientific	Uses cryptic symbols, matrix operations
Basic	1963	Education	Microsoft's first product: a Basic interpreter
C	1972	Systems	Original Unix language, with low-level access, high-level operators
C++	1982	Systems	Primary systems, app development programming language
Cobol	1960	Business apps	Very verbose
Eiffel	1990	General apps	
Forth	1969	General apps	Stack-oriented, threaded language
Fortran	1954	Scientific	
HyperTalk	1986	Information collection	Popularized on Apple II
Java	1994	Web	
JavaScript	1994	Web	
Lisp	1956	Computer science, artificial intelligence	(Statements (use (many) parentheses))
Logo	1967	Education	
Pascal	1968	Education	
Perl	1986	Web	Powerful scripting language for text docs
PL/I	1964	General apps	
PostScript	1982	Document prep	Stack-oriented, threaded language
ProLog	1979	Computer science, artificial intelligence	
RPG	1965	Business reports	Cyclical report generator
Smalltalk	1972	Computer science, artificial intelligence	First object-oriented language
Snobol	1962	Text analysis	Optimized for string processing
Tcl	1990	Web	
TeX	1978	Document prep	
Visual Basic	1990	General apps	
Visual Basic Script	1995	Macros	

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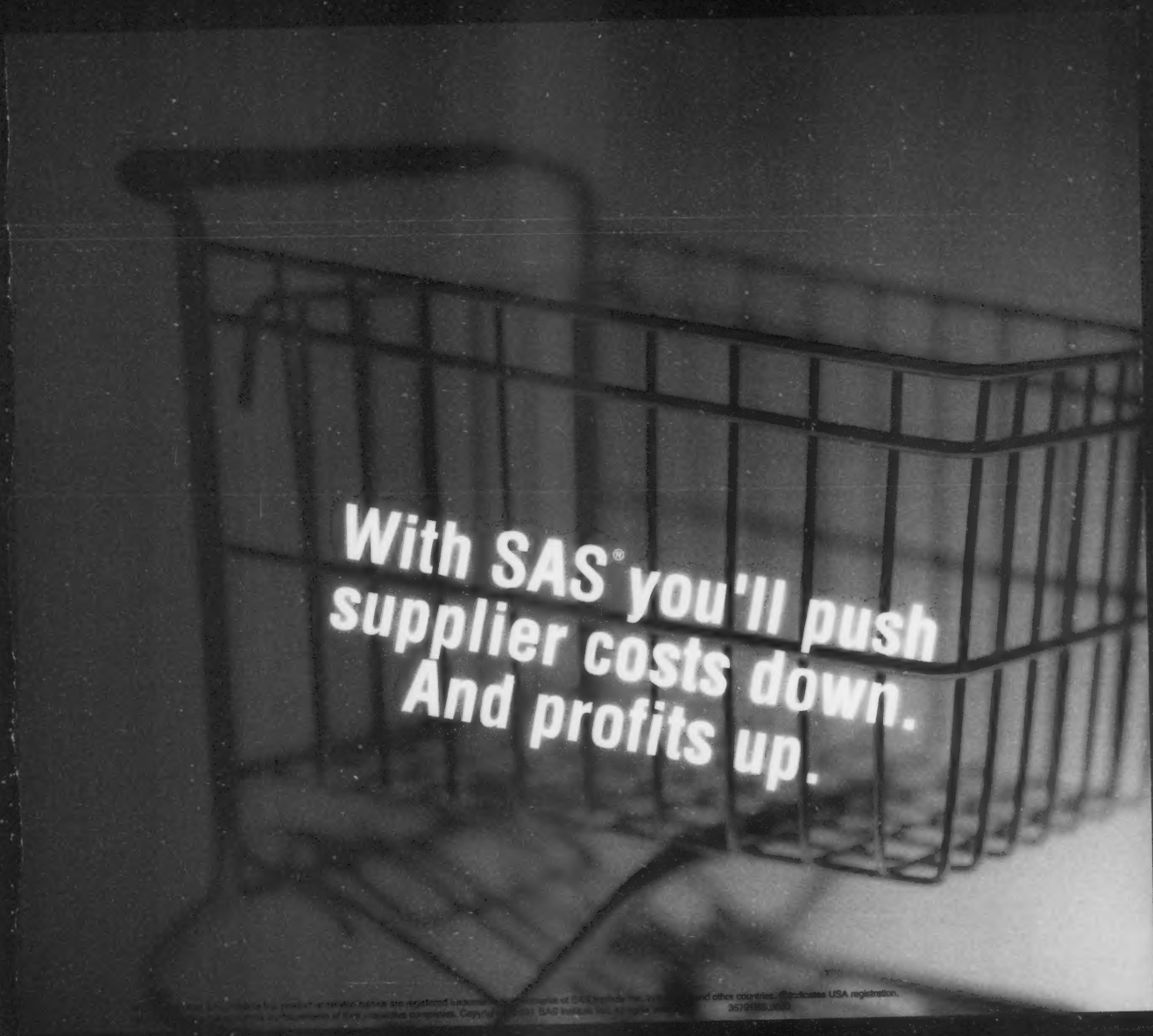

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More Than a Game

As computer game machines come with more features, they have the potential to take on PC functions.

By Mathew Schwartz

IT'S THE BATTLE for delivering new types of paid content to consumers. On one side of the ring: PCs, WebTV, inexpensive Web-surfing appliances and many companies trying to decide how and when television and the Internet will "converge." On the other side: Sony, and a machine ostensibly built to play games.

Sony Corp. is poised to do an end run around every other company trying to figure out which Internet device — after PCs — a majority of consumers will embrace in their homes. Sony plans to do all this with the $299 PlayStation 2 (PS2), which debuts in the U.S. this fall.

Don't let the purple highlights fool you: Besides playing DVD games, the PS2 is also a Net-capable multimedia device that can surf the Web, send e-mail and play DVD movies. More important, analysts say, it will be the first home-based multimedia and Internet-capable device since the PC to sell millions of units. Those units, attached to consumers' televisions, will give Sony a standard platform for selling content. The company will be able to offer, for broadband downloading, movies to rent, new games or music for MP3 players. It will also be able to sell PS2 owners subscriptions for Internet access or online gaming.

Forty percent of U.S. households already own a gaming system. Last year in the U.S., the industry generated more than $7 billion. As more consumers buy Internet-capable gaming consoles, the potential for services revenue increases. Tokyo-based Sega Enterprises Ltd. already has a subscription-based online multiplayer gaming zone for its next-generation Dreamcast console.

Sony has also announced an electronic distribution network via broadband for the PS2. Next year, consoles from Kyoto, Japan-based Nintendo Co. and Microsoft Corp. will hit the market. Some analysts predict that console makers might distribute machines for free, if consumers sign up for multiyear Internet service provider contracts.

Sony says it will offer an Ethernet adapter card for the PS2. Next year, it will also begin distributing electronic content via a secure, encrypted network. Users will be able to download games to a peripheral PS2 hard drive. Presumably, users could also order content such as streaming movies.

Unlike in today's PC operating system market, there is no one dominant next-generation game console maker. Many experts pick Sony as the likely winner, but that presupposes that customers will embrace the hardware and that game makers will develop the choicest titles for PS2.

While PS2 will hit shelves this fall, the broadband technology and peripherals won't make much headway until next year. Even then, experts say, determining the winner will mean waiting for game developers to learn how to wring every last polygon out of the hardware and software.

"Generally, game consoles have a five-year life span, and two to three years in, developers really get an idea of what the hardware can do," says Billy Pidgeon, an analyst at Jupiter Communications Inc. in San Francisco.

Until then, expect the competition to keep heating up.

Sony PlayStation 2

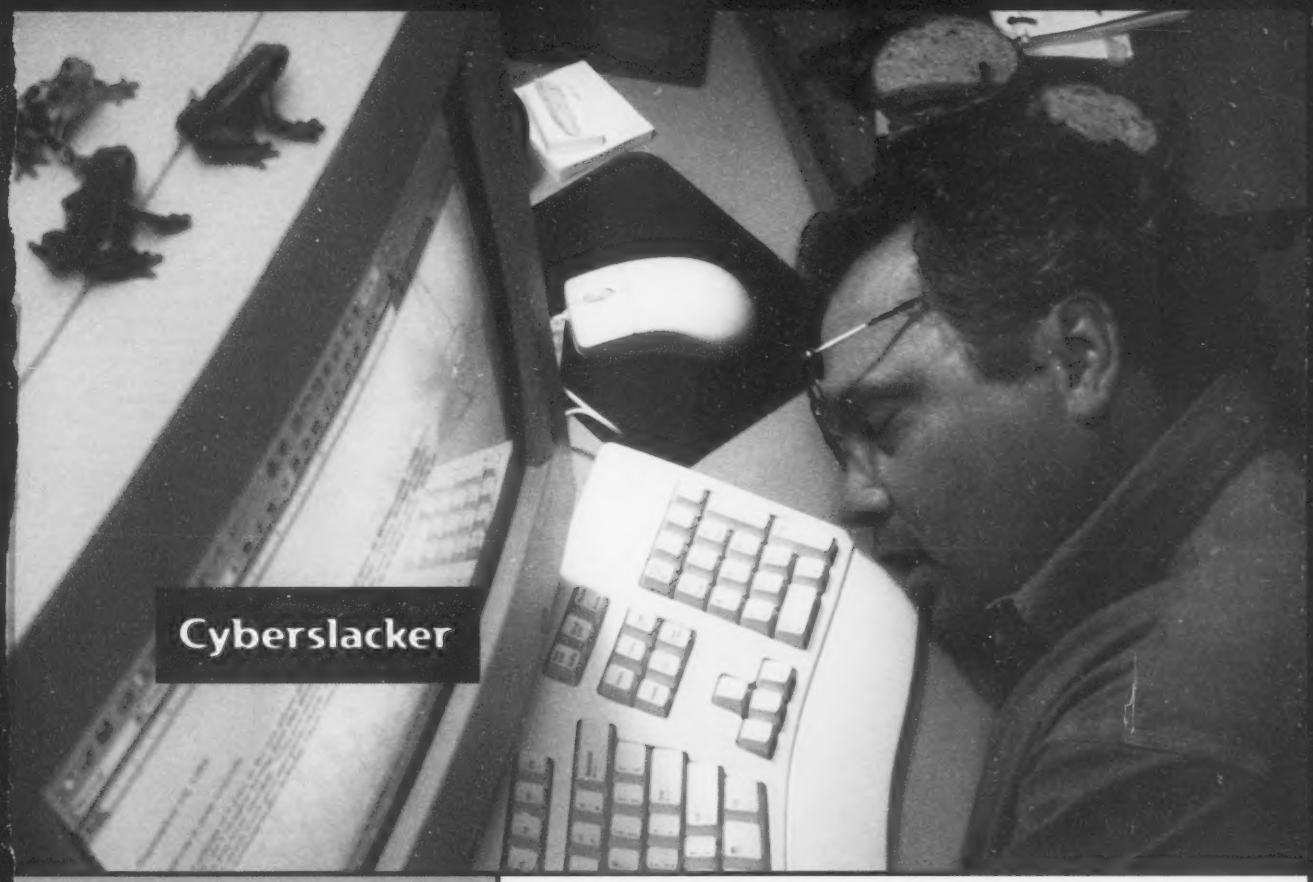
CPU CORE: 128-bit RISC
CLOCK FREQUENCY: 300 MHz
RAM: 32MB
DVD-ROM: Plays games, DVD movies, CDs
PORTS: Universal Serial Bus (2), i.Link (IE1394, a.k.a. FireWire), Type III PC Card slot

In comparison, today's top-end PCs can have 512MB of RAM with 866-MHz chips inside. But because game consoles are designed to play games, and not run overblown operating systems, their games often have better resolutions and crash less often. "The PC is being used for entertainment purposes, but it's accidental and not very good, because it's designed for so many other purposes," says David Cole, president of game-analyst firm DFC Intelligence in San Diego.

Know the Contenders

Though Sony's PlayStation currently dominates the game-console market, analysts say all bets are off. Consumers will gravitate to the system with the best games. Here are the contenders:

Name	Manufacturer	U.S. Availability	Note
DREAMCAST	Sega	Fall 1999	Early edge: 2 million already sold
PLAYSTATION 2	Sony	Fall 2000	Sony currently dominates the game-console market with the 5-year-old PlayStation
DOLPHIN	Nintendo	Spring 2001	Nintendo's last console, N64, wasn't a market success
X-BOX	Microsoft	Fall 2001	It will be the first time that Microsoft, a newcomer to the game-console market, has made its own hardware



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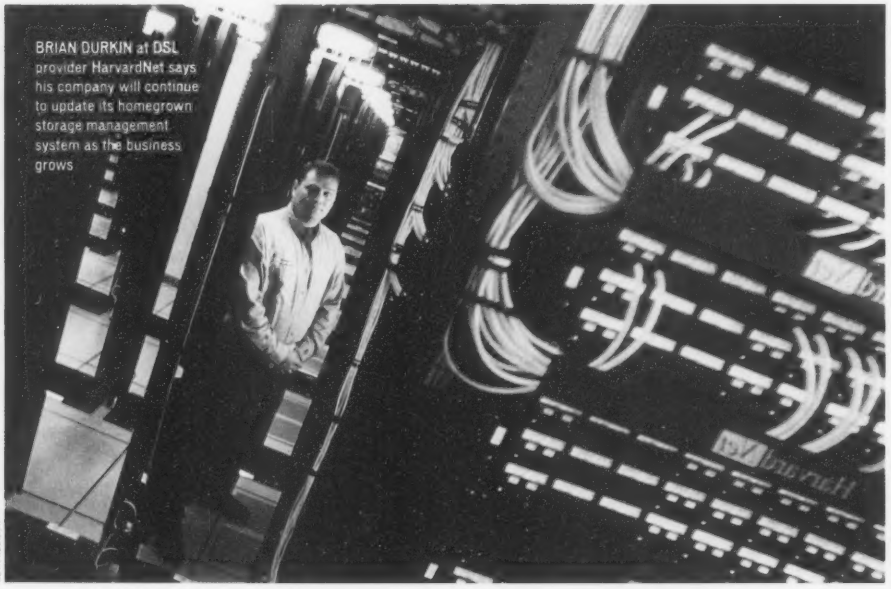
Do-It-Yourself

Masters of high-end storage often devise their own tools and strategies. Here are a few of their secrets. By Elizabeth Ferrarini



BRIAN DURKIN at DSL provider HarvardNet says his company will continue to update its homegrown storage management system as the business grows

SEAN REGNIER

INTERLAND INC., a Web hosting firm in Atlanta, decided to build, rather than buy, a tool to track space usage for its more than 78,000 small to medium-size Web sites. Seventy percent of the sites reside on Windows NT servers and the rest are on Linux. A 6 terabyte (TB) XP256 RAID system from Hewlett-Packard Co. provides the main storage.

So, what's going on here? Tools for monitoring and reporting disk space usage for Windows NT servers have existed since the operating system first came on the market.

"We looked at a lot of off-the-shelf tools, but they didn't offer the scalability to support an application service provider environment. So we built," says Robert Malally, Interland's chief technology officer.

Load balancing. Capacity optimization. Storage quota management. Server availability. When it comes to basic storage management applications, many e-storage services have decided to build rather than buy, even from respected storage management vendors.

The Internet has redefined storage management requirements. Information technology departments now hand off e-commerce storage to outside services, ranging from regional Internet service providers to Fort Knox-like data centers. These e-storage services must provide extreme storage scalability, almost 100% system availability and flexibility to manage growing collections of storage resources.

John Webster, a storage analyst at Illuminata Inc. in Nashua, N.H., says one e-storage service has seen its storage capacity growth rate go from 1TB per month to 1TB per week. "A lot of storage management tools on the market just can't handle this kind of growth. E-storage services can easily justify building management tools for the most mundane tasks," he says.

Homegrown Foundations

Although the company has reached a level of success, as indicated by its $200 million in funding to date, HarvardNet Inc., a Boston-based Digital Subscriber Line (DSL) provider and Web hosting service, has continued to update and use its homegrown tools for managing storage on Windows NT and Sun Solaris servers.

Brian Durkin, director of systems engineering at HarvardNet, says some of those tools date to 1996, when the company's hosting business began. For its shared-server service, HarvardNet uses its disk utilization tools on Windows NT servers to monitor file growth on disk drives, and on Unix systems to monitor the file system for growth, server problems and growth patterns in a customer's space.

HarvardNet's expansion plans include opening one 50,000-square-foot data center in New York, a second in Philadelphia and a third, possibly in Washington. "To support the DSL and the Web hosting businesses, we'll continue to augment our homegrown tools while we evaluate other storage solutions, such as storage-area networks," Durkin says. "We are looking at building advanced monitoring tools

to handle our capacity plans."

Some e-storage services have turned themselves into superluxury data hotels for Fortune 1,000 firms that don't want to haul their servers off to a data center and then manage them remotely. Calling themselves "netsourcers," these one-stop-shop online services have built a complete IT infrastructure, including data centers with server and storage hardware (and even spare parts), switching equipment, IT personnel and storage tools to manage everything. Building vs. buying has paved the way for some of these e-storage services to set up shop and maintain business.

Intira Corp., which has three U.S. data centers, has built its business for Fortune 1,000 organizations that want not only to outsource e-commerce but also to provide a good home for other business applications. Founded in 1998, Pleasanton, Calif.-based Intira has stocked the centers with storage products from vendors such as EMC Corp., HP, IBM and Sun Microsystems Inc. but manages them largely with an array of homegrown tools.

For servers and storage, John Steensen, chief technology officer at Intira, says his company has built an extensive, real-time system (layered over HP's OpenView) that monitors 400 data points so customers can be assured of server availability and adequate storage capacity. If a customer's storage exceeds a certain threshold, then Intira carries out the customer's escalation procedures for allocating more space through load balancing.

"We built because there weren't any management suites that went from the bottom of the network to the top. We didn't want to buy tools and glue them together into a coherent picture for our customers," Steensen says.

Doubts About Do-It-Yourself

Another netsourcer, GlobalCenter Inc. — Global Crossing Ltd.'s Web hosting division, which came with the acquisition of Frontier Corp. — has built up its IT infrastructure (which includes eight data centers) by riding on GlobalCenter's network and through a combination of buying, building and forming partnerships.

Jason Schaeffer, director of systems and infrastructure at the Sunnyvale, Calif.-based company, acknowledges that the firm built a lot of storage management tools during its early years in 1996 and 1997, but he says GlobalCenter is getting out of do-it-yourself storage tools. "We're not looking to do that anymore. We're getting the key storage management tools we need either through partnerships or acquisitions," he says.

Schaeffer says a lot of his competitors have built their own storage management tools, but he no longer thinks it makes sense for his company.

"Developing storage management suites doesn't make sense, especially if it's not your core competency," he says.

Managing storage capacity on servers hasn't turned into a juggling act for GlobalCenter. "We don't allow our capacity to exceed a 40% usage rate. If it does, then we go to fail-over," Schaeffer says.

Carl Howe, a research director at Forrester Research Inc. in Cambridge, Mass., says some of the management infrastructures that e-storage services have built "may be prone to sporadic crashes for no apparent reason or staffed with individuals who don't understand how to resolve problems."

Another analyst points to a widely reported 30-minute outage at Charles Schwab & Co.'s Web trading site last year that left thousands of customers fuming. Schwab was trying out a new storage management product it had developed for setting up a dedicated space for DB2 transaction logs. The idea was to keep the logs from filling up other storage areas. Ironically, the new product generated a large log file that filled up a partition. When the storage management application tried to access data on the disk, the disk locked, bringing down the entire Web site.

The outage could have been avoided if Schwab had built a tool for detecting how quickly partitions filled up with log files, but that development was overlooked as the tools were developed in-house, says Webster.

Perhaps inevitably, building storage tools in-house has given some developers the notion to take their ideas to market.

Chris Hickson and Steve Anderson — both veterans of Microsoft Corp.'s Microsoft Network (MSN) online service — parlayed their knowledge of load balancing and experience in building load-balancing tools to raise $7 million in venture capital to set up Viathan Corp. in Seattle. This start-up solves one key problem faced by many online services: how to allocate Web database storage dynamically.

The duo joined MSN when it was a proprietary service with about 1 million users. Anderson, Viathan's CEO, says, "We were working on scaling initiatives for what we thought were a lot of users. Microsoft then opened the floodgates, and we had our work cut out for us." Once it was opened to the Web, MSN jumped to 4 million users within a few months. Microsoft's Hotmail acquisition took MSN to 20 million users. "Very few companies had seen this type of scaling," Anderson says.

He says scaling at the application server layer was easy to do. But scaling broke at the back-end SQL Server database layer. Hickson and Anderson wore their fingers out writing code to get back-end databases to accommodate armies of new users and to keep track of new information about each user. They also got tired of being available around-the-clock to wake up servers that took a siesta.

They found that e-commerce relational databases yield two types of information: catalog information, which grows statically, and user information, which grows exponentially.

"Amazon.com may add 200 new titles to its book catalog daily but add 5,000 new users each day, along with information about current users. The database has to keep track of each user's purchases, shopping-cart history and pages clicked on," says Anderson. Storage management tools can't handle the massive scaling required by this type of Web data, he says.

The duo built the Viathan load-balancing software for Web sites such as Hotmail and established e-storage services that maintain user information in back-end SQL Server databases. The software virtualizes back-end databases across a cluster of thin Windows NT servers. The software handles the partitioning, clustering, replication and fault tolerance for the entire system.

Anderson says that many storage management issues for the Web have yet to be solved and that some of the answers are being developed in IT shops right now to address specific problems. "IT professionals shouldn't hold back their entrepreneurial ambitions, especially if their storage management tools can satisfy a universal customer need," he says.

Ferrarini is a freelance writer in Arlington, Mass.

Inside Your E-Storage Service's Tool Kit

How do you know if your e-storage service offers a bulletproof environment for managing Web storage, as well as for optimizing storage capacity for maximum performance? Make sure it has the tools to do the following:

- Easily locate what storage hardware (such as physical disks) and software (such as remote backup service applications) exist within the organization.
- Know how much capacity is being used at any time and track such usage to forecast needs and plan storage strategies.
- Configure a disk subsystem among multiple servers on different platforms and detect and correct hardware and software problems (both locally and remotely).
- Automate the procedure for physical movement of outboard data applications such as data warehousing or for moving items between storage media.
- Provide central, real-time notification of the exact nature of errors in a network and maintain a record of those problems.
- Monitor on- and off-site tape, optical or other media.
- Provide an ongoing view of the application, server and subsystem performance to spot problems not apparent through other, more granular disciplines.
- Specify rules or policies for managing hardware, files, users, schedules and media. – *Elizabeth Ferrarini*

Storage Tools

PHANTOM WORKS

AT THE PHANTOM WORKS M&CT unit, Albert Erisman (left) and Kenneth Neves take a detailed long-term look at technology trends for Boeing

REX ROSTEDT

Boeing's advanced research unit has two jobs: to 'make sure something doesn't sneak up on us' and to develop new technology, such as computers that predict how a part will feel before it's built. By Gary H. Anthes

A TECHNICIAN reaches behind a panel in the cockpit of a Boeing airplane and feels around for a part that needs to be replaced. He unsnaps it and tries to pull it out, but the part bangs into one obstruction and then another.

No matter how the technician maneuvers it, or how hard he pulls, the part remains trapped by surrounding components. The technician finally realizes the part is just too big to remove.

But no passengers will sit on this jet waiting for the problem to be solved. The part just needs a little design tweaking — in software — before it's built and put into a real airplane. Designing a complex structure with a computer isn't new. The Boeing Co. designed the 777 airplane in the early 1990s without ever building physical mock-ups or prototypes; the 777 was the first airplane ever "preassembled" that way. But now Seattle-based Boeing is pushing the computer-aided design and manufacturing envelope in a new direction, called "haptics." Inventing the information technology behind haptics is the job of Phantom Works, Boeing's Bellevue, Wash.-based advanced research and development arm.

Computer-Aided Touch

Haptics — from the Greek word *haptein*, to touch — is virtual reality that users can feel as well as see. Manipulating a robotic arm, the designer guides an image of a part through an assembly on his screen. When the part hits something, the arm stiffens and stops. The designer can maneuver the part and feel the result, just like he would if he were handling a physical object.

"Now, we'll not only build the mock-up electronically, we will simulate what it's like to service it when it's in the field," says Boeing CIO Scott Griffin. "We can go out to our airline customers and say, 'We have actually maintained this airplane already, in the computer, and we know we are not creating problems for you.' "

The mission of Phantom Works, Griffin says, "is to look at what's coming down the pike — what's several years away — and pull it back to today and deploy it at Boeing."

Phantom Works employs about 4,000 scientists and engineers in areas such as manufacturing, avionics and IT. The Mathematics and Computing Technology (M&CT) unit within Phantom Works has an annual budget of $40 million and 250 researchers, most of whom hold advanced degrees in computer science. Current projects include research in expert and neural systems, communications, distributed systems, visualization, performance and scalability modeling, intelligent agents, intrusion detection and 16 other topics.

"Our group looks at those technolo-

gies that cut across the whole company and tries to understand what are the trends in those areas," says Albert Erisman, director of M&CT. "We do R&D and advanced prototyping, but it's more 'R' than 'D.' " Each year, Erisman says, he creates a detailed 10-year technology forecast for the company.

Boeing put all its R&D teams — IT, engineering, manufacturing and so forth — in one organization so they can cross-pollinate. "For example, one of the things M&CT works on is high-speed machining," Griffin says. "That's not a computing application per se, but the math and algorithms behind it — for example, how fast can a cutter move across a surface but not generate too much heat — came out of that organization. Erisman's people are right on the bleeding edge of that.

"M&CT has two jobs," Griffin adds. "One is to look forward and make sure something doesn't sneak up on us, like Amazon.com sneaked up on Barnes & Noble. The other is to help deploy technology. So they don't sit in a lab, they spend considerable time out in the factory."

A big jet contains some 3 million parts, and its life cycle can span 70 years, from initial concept to final landing. But the underlying IT changes every 18 months, Erisman says. "There are some unique problems associated with the size and life cycle of our products — the complexity, safety issues and so on," he says.

Filling in the Holes

"These issues are the drivers for us in terms of what R&D is required," Griffin says. "What we are trying to do is understand The Boeing Co., understand where we can use existing technology, understand where the holes are and then fill the holes."

There are a lot of holes. While Boeing's goal is to buy commercially available IT products whenever possible, often those products need to be modified or enhanced in order to scale up for use at the $58 billion aerospace company, says Kenneth Neves, M&CT's director of computer science. "For example, you can buy something like [Microsoft's] NetMeeting, and two or three people can have a conversation. You try to do it with 30 to 40 people, and it falls down."

And sometimes the needed technology doesn't exist. "We are building information systems for the military, and we are using hybrid satellite networks and everything is mobile," Neves says. "Not just the nodes, but there are mobile networks within the network, and we have what we call 'system-of-systems' issues. This is an area where the consumer market doesn't provide the answers."

Sometimes the answers come wholly from within Phantom Works, and sometimes they come from research partnerships that Boeing maintains with other aerospace companies, IT vendors, universities and government agencies such as NASA and the U.S. Department of Defense. Its relationships with universities are especially close, and professors often do their sabbaticals at Boeing. "They love it at Boeing because it has such a rich collection of problems," Erisman says with a laugh.

Boeing is working with the University of Washington at Seattle on the haptics project and with the University of Calgary at Alberta on mathematical models of how business decisions are made.

Legions of Computers

Phantom Works is also experimenting with software developed at the University of Virginia at Charlottesville. Called Legion, it's a wide-area operating system designed to build a virtual computer from any number of distributed hosts and objects while presenting to the user the image of a single computer.

Legion finds and schedules resources and handles security issues among disparate operating systems and objects written in different languages. Neves says it could possibly run Boeing's highly complex and distributed product data management and manufacturing resource control systems.

Phantom Works has also formed R&D partnerships with a handful of major IT vendors. "We work on things that will benefit both companies," Neves says. "No money changes hands, and the individual researchers have to want to do it." For example, Boeing is working with IBM to develop computer security and intrusion-detection technology.

Boeing is also working on large-scale, distributed systems with Hitachi Central Research Laboratory in Tokyo and HyPerformix Inc., an Austin, Texas-based start-up. "A concern is, how can you know what [the system's] performance is going to be, where to put the data servers, what bandwidth do you need and how does it scale with load?" Neves says.

Predictive Modeling

The answer, he says, is "predictive performance modeling" in which models of user behavior are combined with models of systems behavior. Just as haptics will let Boeing repair a plane before building it, this technique will let the company stress-test a big system before it's deployed.

Neves says this new modeling technique saved Boeing from buying a $24 million server last year. "We showed by predictive modeling that the way [users] were locating and updating their data was causing traffic bottlenecks on the network," he says. "Adding the server would have reduced performance even more because the plan was to further fractionate the database," which would have only increased the bottlenecks.

M&CT's mission statement says it will "create, evaluate and disseminate" technology.

"Dissemination is the goal for everything we do," Neves says. "If the result is a paper widely accepted in the world, but it has no impact on Boeing, that would be one of our failures."

But dissemination is hard, he admits. "You have [internal] customers who don't know what the new technology is, and you say, 'This can have an impact.' And they say, 'Well, it's also disruptive. It bothers us. Go away.' "

> Our group looks at those technologies that cut across the whole company and tries to understand what are the trends in those areas.
>
> ALBERT ERISMAN, DIRECTOR, MATHEMATICS AND COMPUTING TECHNOLOGY UNIT, PHANTOM WORKS

CREATING FINE-GRAINED SECURITY

In March, Boeing and three other companies announced that they would jointly establish an independent, Web-based trading exchange for buyers and sellers in the defense and aerospace industries.

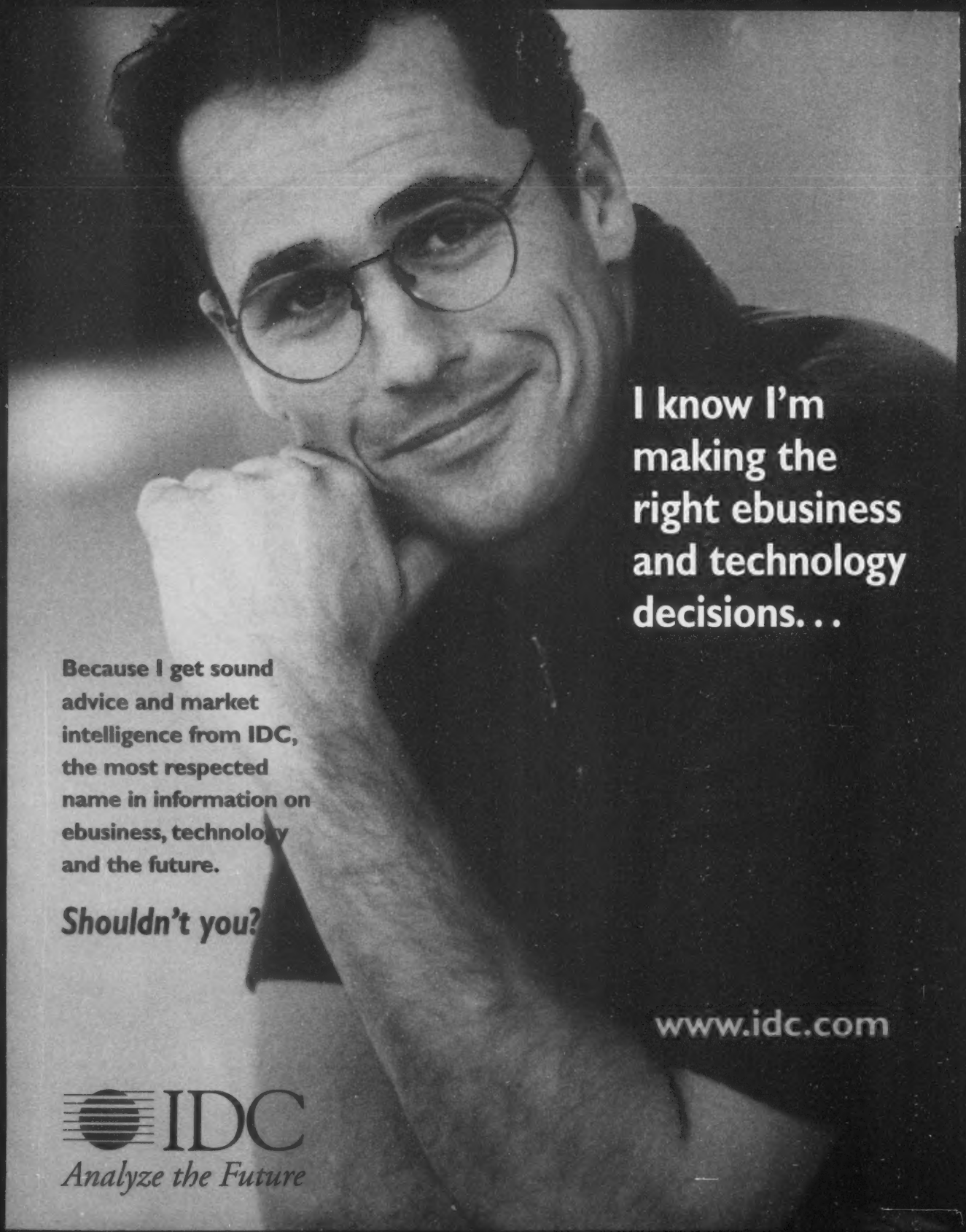
But the exchange idea raised an interesting question: How can a system allow some data to be freely shared between partners, or between buyers and sellers, while those same companies tightly guard other data when it relates to competitive activities?

The answer is data-level security. Traditionally, companies have protected whole computers using firewalls. What is increasingly needed for business-to-business commerce is finer-grained protection at the level of individual files or data elements, with access to the data based on the profile of authenticated users, says Boeing CIO Scott Griffin [See "Security the Way It Should Be," Technology, July 10].

"It's important for us because we'll compete with Lockheed Martin on one program and work with them on another," he says. "So we are shifting from keeping people out of our computers to protecting the data in the computer. That's much harder."

But hard problems are what Boeing's Phantom Works lives for, and its computer science research group is pioneering data-level security. The exchange will use XML to describe the information being shared, and the Phantom Works is figuring out how to embed information about security levels into the XML metadata. "What we are doing is using XML to describe not only the part, for example, but to have intelligence within [the XML] that includes who can see the data and who can't," Griffin says. "That's a brand-new thing, an R&D thing."

– Gary H. Anthes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A Forecast for Better Firewall Performance

Rainfinity's node clustering software breaks firewall server bottlenecks

BY STEVE ULFELDER

RAINFINITY INC. thinks it has found a better way to address the three "-abilities" of the Internet age: scalability, reliability and flexibility. The Mountain View, Calif.-based start-up sells clustering software that allows information technology administrators to quickly create nodes on a network.

Rainfinity claims that its technology allows servers with different functions — Web, firewall and load balancing, for instance — to be grouped into a single cluster.

The goal: to widen network bottlenecks and reduce single points of failure through simplicity.

The company's tools "duplicate information for robust throughput," according to William Hurley, an analyst at The Yankee Group in Boston. "It simplifies the process and requires so little input from the IT staff."

Rainfinity's biggest competitors may turn out to be cheap "appliance boxes" — dedicated, single-function servers. The company's glaring weakness is that its products work only with software-based firewalls from Check Point Software Technologies Ltd. in Redwood City, Calif.

When It RAINs

Rainfinity is built around a technology called Reliable Array of Independent Nodes (RAIN). It began as a California Institute of Technology research project funded by NASA's Jet Propulsion Laboratory and the Defense Advanced Research Projects Agency.

The original goal of the RAIN project was to "reduce the cost of reliable systems" in space missions, says Charles Fan, Rainfinity's co-founder and chief technology officer. NASA wanted high performance and high reliability with off-the-shelf hardware.

Fan says he believes Rainfinity has achieved this goal by reducing the number of network "hops," or devices through which traffic must pass. This also tends to strengthen the weak links in the network chain by eliminating single points of failure.

Rainfinity's software installs on one server per cluster and then propagates itself to the rest of the cluster — including servers that are installed later.

This time-saving feature is a big benefit to Dresdner Bank AG in Frankfurt, says Norbert Schaar, a network security manager at the bank.

Widening a Bottleneck

Ease of implementation was also a factor when Boise-Cascade Corp. recently chose Rainfinity's Rainwall over its competitors' products.

"We looked at some hardware implementations," says Victor Thompson, a network engineer at Boise-Cascade in Boise, Idaho. "But we have seven legs off our firewall, so that got unwieldy and expensive."

Rainfinity software, which works on any combination of Solaris, Windows NT and Linux platforms, sits between the Internet and the corporate intranet. Rainwall, aimed at firewalls and virtual private networks (VPN), lets several firewalls act as a cluster, widening a common bottleneck. A recent upgrade added concurrent VPN load balancing and VPN fail-over features.

Rainfront, a newer product, also bolsters firewall availability but sweetens the pot with traffic management functions such as Web server load balancing. The latter feature was important to Dresdner Bank, according to Schaar.

"As far as I know, Rainfinity is still unique with this feature," he says.

The bank has used Rainfinity on many clusters of Web servers running Solaris. "We're using it for resilience," Schaar says. "As the e-commerce stuff gets more and more important, it's more important that the apps are always available."

More Add-Ons

Of course, there are plenty of ways to address availability. These days, throwing servers at problems is easy, popular and cheap.

And therein lies the rub for Rainfinity: In today's climate, the company may have the best answer to a question that nobody has asked.

Then again, maybe not. "Our competitors might add load-balancing [tools] on either side of the firewall," Fan says. "OK, they expanded the firewall — but they added two more links." That adds up to extra network hops that traffic must traverse.

Whether understaffed, harried IT shops will pay for this elegance is an open question. "Appliance boxes are cheaper and more robust day-to-day," says Hurley.

Rainfinity's task, he says, is to "add new features to stay ahead of the curve."

Ulfelder (sulfelder@charter.net) is a freelance writer in Southboro, Mass.

RAINFINITY'S (from left) Shuki Bruck, chairman; Charles Fan, CTO; senior engineers Phillip Love, Paul LeMahieu and Vincent Bohassian; and Gil Magalit, board member

Rainfinity Inc.

Location: 901 Landings Dr., Mountain View, Calif. 94043

Telephone: (650) 625-1111

Web: *www.rainfinity.com*

Niche: Internet traffic management software

Why it's worth watching: This software uses clustering technology to alleviate Web server and firewall traffic bottlenecks and improve reliability.

Company officers:
- Olivier Helleboid, CEO
- Charles Fan, chief technology officer
- Steve Wong, CIO

Milestones:
- 1998: Founded
- 1999: First product introduced

Employees: 75; 400% annual growth projected

Burn money: $15 million from New Enterprise Associates and Alloy Ventures Inc.

Products/pricing: Rainwall 1.5 and Rainfront 1.0 both start at $4,995.

Customers: Chicago Stock Exchange, Scandinavian Airlines System, Olde Discount Corp. and Xerox Corp.

Partners: Check Point Software Technologies

Red flags for IT:
- Works only with software firewalls from Check Point.
- With hardware costs dropping, IT managers may prefer to reduce bottlenecks by adding servers.

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STATE OF THE MARKET

Scaling Firewalls

"Rainfinity has only attacked a small portion of the market," says Mark Hoover, president of consultancy Acuitive Inc. in Wilmington, Del. "But it's a portion of the market that's been begging for a solution: making firewalls scalable."

Hoover says the high-availability market has changed dramatically. Most firewalls were software-based as recently as two years ago, but there's now a near 50/50 split between hardware and software. The hardware approach, which creates a "firewall sandwich," is popular now, with well over a dozen vendors offering such technology.

Software vendor Rainfinity is seen as competing with switch vendors such as Cisco Systems Inc. because they're attacking the same problem. Web switches are increasingly being used to balance Web traffic among servers, which means better performance and security.

Stonesoft Corp.

Espoo, Finland, and Atlanta
www.stonesoft.com
Stonebeat FullCluster software works with Check Point's FireWall-1, the leading firewall. But unlike Rainfinity's products, it also works with Axent Technologies Inc.'s Raptor and Network Associates Inc.'s Gauntlet.

Alteon WebSystems Inc.

San Jose
www.alteonwebsystems.com
Formerly Alteon Networks, the company is a leader in the Web switching market – tracking and forwarding Web sessions rapidly. Its switches balance traffic among servers, which can reduce latency and improve security.

Cisco Systems Inc./ ArrowPoint Communications Inc.

San Jose
www.cisco.com
Cisco recently purchased ArrowPoint for its Content Smart (CS) Web switches. The CS line runs network services software, WebNS, that performs many of the same functions as Rainfinity tools – further blurring the line between hardware and software in this field.

Foundry Networks Inc.

San Jose
www.foundrynetworks.com
Foundry sells a full line of Internet traffic management hardware, including routers, switches and switching routers. Its ServerIron switches handle industrial-strength Web loads. – *Steve Ulfelder*

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Knoxville, Tenn.

Tennessee's Tech Corridor

Forget country and western musicians. The keyboards making beautiful music here come with a mouse and monitor – and high demand for IT workers.
By Erik Sherman

IF YOU PICTURE Tennessee as little more than a destination for country and western musicians, you're thinking about the wrong type of keyboard.

This state has information technology jobs aplenty, with a growing number of companies falling in the eastern Tennessee area, between Knoxville and Oak Ridge. In fact, the area has dubbed itself Tennessee's Resource Valley or the Tennessee Technology Corridor, depending on whom you ask.

What just about everyone does agree on is that the region has become a place for IT professionals to work on leading-edge technology and enjoy a low cost of living.

Job Market

At one time, working in IT in the region probably meant working for the government, either at a U.S. Department of Energy facility like Oak Ridge National Laboratories or in a U.S. Department of Defense facility.

The government has been scaling back its operations, cutting approximately 6,000 jobs over the past seven years. But those losses, mostly achieved through early retirement and attrition, have had little impact on IT workers.

More than 500 high-tech companies are between Oak Ridge and Knoxville. Federal technology transfer programs have helped spark the growth, as has the auto industry.

"The economy is pretty well diversified. There's a lot of automotive manufacturing work in the region," says Tom Rogers, president of Technology 2020, a nonprofit economic development organization. "We're surrounded by automotive plants."

Toyota Motor Corp. is located a couple of hours north, while Nissan Motor Co. and Saturn Corp. have plants about the same distance to the west. That has made the Knoxville area ideal for many automotive suppliers, virtually all of which must have extensive IT infrastructures to do business with auto manufacturers.

Companies such as Round Rock, Texas-based Dell Computer Corp. and Hewlett-Packard Co. have opened large facilities in the area. Technology 2020 is also developing a business incubator that is scheduled to open in September. Back-office operations have expanded, with the arrival of players such as Atlanta-based Nova Information Systems Inc., one of the largest credit-card processors in the country. The many professionals in the area have yet to saturate the job market, though.

According to Glenn Zahn, president of Oak Ridge recruiting firm Staff I.T., a programmer can typically find a new position in about two weeks; a network engineer might take two to three weeks longer. And start-ups are on the rise.

"[The local job market is] becoming more active all the time. With the high technology coming out of Oak Ridge national lab, the workers here that are very technical are venturing into their own companies," explains Zahn.

Money Matters

Income and living expenses in Tennessee are both the good news and the bad.

The bad news: IT salaries are lower than national averages by approximately 3% to 9%, depending on the type of job. That's still better than the pay in most other occupations, which ranges 12% to 15% less than national averages.

The good news: The area's cost of living can make that money look very good. Housing costs are 15% lower than the national average and almost 22% less than in major cities, with midrange homes running from $80,000 to $130,000.

"Knoxville is considered a minor market, so we don't have the overcrowding, and there's plenty to go around, which drives prices lower," explains Zahn.

Other costs of living are comparably low — health care costs, for example, run 18% below the national average — and there's no state income tax. The Oak Ridge office of Science Applications International Corp. (SAIC), a national consulting firm, has found that its employees have an economic advantage over those working in major cities.

"To have the same standard of living, you'd have to have a 25% salary increase to be even," says Mike Cuddy, vice president for IT solutions at SAIC's Oak Ridge office. "Generally speaking, we find it much easier to recruit people to live in Oak Ridge, Tenn., than we do in Washington, D.C. If you have a family and are looking for quality of life, educational interest and cultural interest, this region is very attractive."

Quality of Life

The area is big on outdoor recreation, and with average temperatures of 75 degrees in the summer and 41 degrees in the winter, it's easy to see why.

Hiking, white-water rafting and kayaking, fishing and golf are less than an hour's drive from the Knoxville area. Cultural activities include a major arts festival, two symphony orchestras, several museums, a ballet company and a zoo.

The region is also relatively conservative, says Ed Lewis, senior vice president of corporate development at Internet Pictures Corp. in Oak Ridge. That makes for a stable area with relatively little job-hopping. Those coming from out of state often arrive with a negative impression of Tennessee that gradually changes.

"When people come to visit and see what they're going to get for their dollar invested from a personal point, those questions go away," says Lewis.

If you want to hop around on the Internet, there's free access for individuals and nonprofit organizations. The Knoxville metropolitan area is moderately large, with just over 659,000 residents in 1998, according to the Census Bureau. Oak Ridge is tiny in comparison, with a population of about 27,000.

"Oak Ridge ... is like a self-contained town. It's separated from Knoxville, and the housing market here is great," says Zahn. "The arts are better here than what you'd find in a town 10 times the size."

Education is relatively strong, with high-school students scoring 11% higher than the national average on the Scholastic Assessment Test in 1995. The region is home to five of the top 10 public schools in the state, and Knoxville is the site of the main campus of the University of Tennessee.

Sherman is a freelance writer in Marshfield, Mass.

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Client Server Developer/Analyst II, Jacksonville, FL. Under general supervision, responsible for maintaining and enhancing the INTERACT build process. Tasks include documenting, designing, coding, and testing enhancements to the build process; writing the external and internal design specifications for all enhancements to the build process; and developing, testing, and implementing the enhancements. Requirements: Masters degree and two yrs of exp. in job offered or two yrs of exp. in computer programming. 40 hrs/wk, M - F, 8:00 am – 5:00 pm. Salary: $60,000 per year. Send resume to: Dept. of Labor/Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, Florida, 32302. ATT:EH, JOFL#2091717.

Software Engineer
For employer in Indianapolis, research, design, develop computer software products for business applications. Apply principles, techniques of comp. sci. and mathematical analysis to develop new programs and software-based processes. Consult with other functional group to analyze, optimize interface of software/hardware. Prepare implementation plan. Develop system testing procedure and user documentation. Use Visual Basic programming as necessary. 40 hrs/wk, 8-5, $60,000/year. Req. Master's (or foreign equivalent) in Electronics Engineering or Computer Science. Send resume and social security number to: Indiana Dept. of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277, Attn: D.P. Gordon. Refer to ID number 8080766.

Emerald Solutions, Inc.
Seeking IT professionals to join our NATIONAL consulting firm.

Software Engineers:
Must have a Bachelor's Degree in Computer Science or related field and a minimum of 5 years related progressive work experience.

Programmer Analysts:
Must have a Bachelor's Degree in Computer Science or related field or the equivalent education and experience.

We have offices in Birmingham, AL, Phoenix, AZ, Greenwood Village, CO, Atlanta, GA, Warren, NJ, Portland, OR, Dallas, TX, Vienna, VA, and Bellevue, WA.

Send resume, including location preference to:

Emerald Solutions, Inc.
Ref#CWAD07
111 SW 5th Ave., #2700
Portland, OR 97204
E-mail:
cwad07emeraldsolutions.com
EOE

IT professionals with a min. of 2 yrs. exp in A or B or C or D or E or F or G or H or I or J or K needed. (A): Precise SQL, Oracle Replication Manager, Hotstand Database, Sequent Numa Q200, E200, Dynex PTX 4.4.4, HP-UX 10.2; (B): Corba, TMN, Versant, Java; (C): VB Script, Java Script, Active-X, MVS, TSO; (D): Nastran, Finite Element Analysis, Paradigm Plus Enterprise, I-Deas, ADAMS, ROLTA/Integraph; (E): JSP, AWT, SWING, Java JDBC; (F): Linux, Oracle Enterprise Manager, Delphi Database Designer; (G): SAS, Symantec Cafe, Java Script, Synesort, IMS; (H): MTS, VB Script, Java Script, COM/DCOM, IIS; (I): SQL Anywhere, Delphi, Perl Script, Code Base, SSAD, OOAD Methodologies, Gentra/PGP; (J): Visual Studio, Visual Cafe, Visual Java++, JDBC, ODBC; (K): TSO/ISPF, DTMF, Expeditor, Platinum, Assembler Macros; Travel reqd. Please send resume & salary reqmnts. to HR, OST International Corporation, 1300 Iroquois Drive, Suite 255, Naperville, IL 60563.

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Programmer Analyst. Design and develop software applications and work with Informix database administration using interactive heterogeneous systems such as CLIX, SunOS, Windows NT for mission critical AM/FM/GIS. Work with development, migration/modification of existing applications. Demonstrated ability working with INFORMIX relational database management system. Demonstrated ability working with migration from Intergraph and Clix workstation to Windows NT platform. $56,000/yr. 40 hr./wk. 9 a.m. - 5 p.m. Must have 1 yr. exp. and B.S. in Comp. Sci., Eng., rel. field/equiv. Send 2 resumes: Case #20001119, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

Programmer/Analyst: Plan, develop, and test computer programs. Maintain and develop software applications on the Macintosh/DOS Platform; code, review, test, and debug the application programs; develop documentation to support programming code, etc. Req. BS in C.S., E.E., or other closely related science/engineering fields plus 1 yr exp. in job offered. Resume to: HR Manager, InfoCure Corp., 1765 The Exchange, Suite 300, Atlanta, GA 30339

OraSoft Consulting Group, Inc., needs IT professionals with a min. of 2 yrs. industry experience in HP Unix, Win NT, Oracle Designer/2000, Oracle Manufacturing, Oracle Enterprise Manager, AOL Travel reqd.

Please send resume & salary reqmnts. to HR, 8201 Greensboro Drive, Suite 1000, McLean, Virginia 22102.

Lead Systems Programmers - to coord. & engage in dev. & research of storage network op'g systems, software & drivers allowing SMP comp systems to use Windows NT to function as intelligent storage controllers. Develop architectural inputs for dev. of company's network op'g system design. Responsible for module sched'g. A solid understanding of NT, I/O subsystems, software drivers & op'g systems is req'd. At least 2 yrs. exp. + Bach. degree in Computer Science is req'd. Salary range $57,500-67,500. Forward resume to DataCore Software, ATTN: Human Resources, FAX#(954)938-7953. No phone calls please.

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Software Engineer req. by software dev. & consultancy comp. Duties: System Analysis, Design and Function point analysis of various types of applications Like Financial application. Payroll, Human Resource. Analyzing existing Application Identify User requirements. Designing and programming in POWERBUILDER 6.0, PFC, SYBASE SQLANYWHERE 5.5, ORACLE 7.3. Develop the class libraries (Common Object Library) for various kind of applications. Knowledge of Sybase Replication Networking , Database Administration, Replicating the data from one sites to another site. Job to be performed at Apex, NC and various unanticipated client sites throughout the U.S. as assigned. Requirements: Masters Degree in either Math, or Engg. or Sci, or Comp. Sci. and one yr. exp. in the job offered or one yr. exp. in the related occupations as Prog. Analyst & Analyst Developer & Group Leader in the job offered. Salary: $71,000/Yr. Hours: 40/hr work/wk, 9:am to 6:00pm. Applicants submit resumes w/Social Security No. to Job Order # NC5703318 & DOT code 030.062-010, Job Service – 742-F East Chatham Street, Cary, NC 27511.

Software Engineer
We are seeking a qualified candidate to design & develop state-of-the art system for diamond business.Utilize knwldg of Windows NT,Oracle (DBA & developing role) , VB (or C++, JAVA), PL/SQL,in improving system by modifying existing features or adding new ones to enhance efficiency. Research & analyze system req'mnts,as well as design,dvlp & implement inventory, purchasing, manufacturing, sales & accounting systems. Reqd: Master's degree in Comp. Sci., Engineering, Maths or equivalent & 1 year exp. Employer will accept Bachelor's degree + 5 years of progressive experience in the computer field. Pls mail resume to JDM Import Co., Inc., 1212 Ave. of the Americas, NY, NY 10036 or fax to 212-575-4688 Attn: HR Manager. No calls please.

SENIOR SOFTWARE ENGINEER to provide on-site consultancy in data design architect, system analysis and design, software programming, testing, training and implementation using HTML, Java Script, PL/SQL, HTP, HTF, relational database Oracle, StBAS in DOS, Windows, Windows NT, UNIX, Solans, and Sintran operating systems; provide logical and physical data model for client database and evaluate database architecture; supervise junior software engineers and programmers. Require: M.S. in Computer Science/Electronics Engineering and three years experience in the job offered. B.S. with five years experience may be substituted for M.S. and three years experience. 40% travel required to client sites within the United States. Salary: $80,000 per year, 8 am to 5 pm, M-F. Apply with resume to: Director of Human Resources, Enterprises Computing Services, Inc., 8744 Main Street, Suite 101, Woodstock, GA 30188.

Systems Analyst (Boca Raton, FL): meet w/domestic & international customers to determine specific needs, which vary from simple business-oriented applications to complex integration, such as SAP, EDI, Electronic Commerce, ANSI X12 transactions, using MERCATOR data transformation tool and its different across-platform products; design & create custom software to solve customer needs, configure systems to meet customer's requests & operate custom software; train final end-users & support implementation. Be able to integrate systems regardless of data origin & delivery location. Bachelor's in Computer Science. M-F, 9am-5pm, 40hr/wk, $41,371.20/yr. SEND RESUME TO LABOR DEPT./BUREAU OF WORKFORCE PROGRAM SUPPORT, PO BOX 10869, TALLAHASSEE, FL 32302. Attn: L.Knight RE: JOFL #2091319.

E-Commerce Manager
We are looking for a qualified candidate to plan,design,test & maintain co's website, develop e-payments & e-credit capabilities, & develop electronic payment & personal profile information exchange standards to enable remote transactional capability using ASP, US, MTS,Java Script,Interdev & HTML. Develop & implement multimedia technology standards for use in online banking & bill presentment on various platforms. Analyze & develop specs., determine feasibility cost & time req'd. Req'd: Masters degree in Computer Sci, Engineering or equivalent & 1 yr exp. Please mail resume to Asprey, Inc. 1466 Broadway, Suite 907, NY, NY 10036 or fax to 212-768-2101 Attn: Mr. Sevani. No calls please.

Senior Software Design Engineer Perform analysis as it relates to an existing system; prepare design documentation and prepare associated time estimates, implement and/or lead project implementation; interface with product marketing, customer support, and other internal departments as needed to complete project implementation. Minimum Requirements: B.S. in Computer Science or the equivalent plus three years experience in the job offered or client/server application development. Prior experience must include a minimum of three years experience in client/server analysis, planning, design, and estimating; use of OO design techniques; client/server application development using C++, Solaris, and Oracle; and on-line transaction processing applications, particularly server processing on Sun Solaris. Hours: 8:00am - 5:00pm M-F. Salary: $65,000 per year. Must have indefinite right to work in the U.S. Contact: Tipton Bradford P.O. Box 105179, Atlanta, GA 30348-5179

Software Engineer
With experience in Unix based communication software to design, implement and test Network Management modules. Must have demonstrated ability in Unix, Winsock communication, socket programming, APL SDK, and TCP/IP protocols; demonstrated ability in using VC++ and Microsoft Foundation Class (MFC) libraries; and experience in Object Oriented Programming Methodologies, Unix Systems and Windows NT/95 environment. Req 2 yrs exp in job offered or 2 yrs exp in Software Development. MS in Computer Science, Engg, Math or related field. Will accept BS plus 5 years of related experience in lieu on the MS degree requirement. Salary is $80,000/yr. 40 hrs/wk, 8:00 to 5:00 pm. Send two copies of resume to Job Order #19992548, PO Box #8968, Boston, MA 02114.

Software Engineer (multiple openings): Perform solution development, requirements analysis, research, design, implementation, testing and maintenance of custom solutions of client-server based information systems using C/C++, Visual C++ / MFC / Win32, ODBC/DAO, RDBMS (Oracle and Access), SQL and Visual Basic in Unix and Windows environment; perform object oriented analysis and design using Rational Rose. Must be willing to relocate on a project-to-project basis. Req.: MS or foreign deg. equiv. in Computer Science or closely related discipline. Hrs: 9a-6p, M-F, $63,500 per yr. Send resume to Axiom Systems, Inc. 2550 Northwinds Pkwy., Suite 440, Alpharetta, GA 30004 Reference No. YZ001.

A fast growing IT company needs Programmers, Programmer/Analyst, System Analysts & Software Engineers for New Jersey and Pennsylvania. All areas of expertise. Immediate need for a System Analyst with financial industry background. Person must have Bachelors' Degree in Finance or related field with at least an equivalent of one year of training or course work in computer field. Must be familiar with Oracle Financial and must have 3+ yrs. of experience in the field of information technology. Also needed a programmer/analyst. Must have a Bachelor's or equivalent with 2+ yrs. of experience as information technology professional. Send resumes to Innovative Solution Systems Inc., 501 Abbott Drive, Suite 1, Broomall, PA 19008; e-mail: iss@iss-soft.com.

eplanets, Inc. a PA IT Co., is looking for Exp. (a) Software Engineers (hvg Mast Degrees or Bach Degree w/5 yrs exp), abd (b) Programmer Analysts with Bach. Degree to fill up the following positions at their work sites at NJ & NY:

Exp. Must have combinations of Unix, C, C++, Sybase and CASE Tools; UNIX, C/C++, INFORMIX-4GL, INFORMIXSQL;

Database Administrators; Must have exp. Create/maintain/monitor databases. Backup databases & create recovery procedures to rescue data loss during system/database crashes. Use IBM DB2 & 3rd party tools/utilities.

Send resumes to HRD, eplanets Inc. 800 North Second St. Suite 100, Harrisburg PA 17102.

Senior System Administrator Major international filtration firm seeks Sr. Sys. Admin to design, configure, install and maintain enterprise-wide computer systems for central and remote Unix, NT, and SUN servers; manage disks and logical volumes for large scale disk systems; analyze hw/sw utilization; upgrade and configure operating system, and do performance tuning. Requires 5 yrs exp. Sys. Admin. in Unix env, adv'd knowledge large scale disk management, expertise w design, installation and performance of enterprise-wide computer systems. Significant on-call for 7/24 Corp Data Center. Apply to: Paul Cavicchi, Millipore Corporation, 80 Ashby Road, Bedford, MA 01730

Systec International, Inc. a NY IT Co., is looking for Exp. (a) Software Engineers (hvg Mast Degrees or Bach Degree w/5 yrs exp), and (b) Experienced Programmer Analysts with Bach. Degree to fill up the following positions at their work sites at NJ & NY:

Exp. must have combinations of Unix Administration, C, C++, Java, Informix, JDBC, Corba, NT Administration, Delphi, Web Development, Oracle, Oracle DBA, Oracle Developer, Visual Basic, Tuxedo, HP Administration, MS Office, and E-Commerce.

Send resumes to HRD, Systec International, Inc., 350 Fifth Avenue, Ste 7812, New York, NY 10118.

Manager, Engineering wanted by Applications Service Provider for job loc in Arlington, VA. Review business reqmts & write engg design specs for integration of ERP sys w/complementary enterprise sys. Manage the engg of information sys solutions. Manage implementation of enterprise, front-office & remotely hosted e-commerce sys. Develop standards for pre-configured business processes & template database. Must have Bach in Comp Sci, Industrial Engg or Mechanical Engg & 2 yrs ERP rapid implementation exp. Respond to: HR Dept, Corio, Inc., 959 Skyway Rd. Ste. 100, San Carlos, CA 94070 or fax: (650)232-3258. CORIO

Software Engineer II: plan, design, develop and implement client/user, server, voice, and related software and subsystems. Must have minimum Master's in Computer Science, 2 years experience (school or employment) in C, C++, Object Oriented technologies, Java, Smalltalk and/or Visual Basic, Unix/AIX, NT, DOS, CTI, CORBA, ISDN, CSTA, OMT tools, Windows API, and 6 months development of telephony systems, and present proof of legal authority for full-time employment in the US. M-F, 8AM-5PM, $63,451. Those interested and qualified, send resume or apply in person to GA Dept. of Labor, Job Order 6521924, 1535 Atkinson Road, Lawrenceville, GA 30043-5601 or the nearest GA DOL Field Service Office.

Software & IT Dvlpt Firm in Syosset, NY seeks to fill the following positions:

1) Software Engineer -Must have Bach in Math, Comp Sci, Bus Admin or Engg or equiv & 3 yrs exp dvlpg & directing s/ware system testing procedures in VB, SQL & Active X

2) Software Engineer -Must have Bach in Math, Comp Sci, Bus Admin or Engg or equiv & 3 yrs exp dvlpg & directing s/ware system testing procedures in Lotus Notes, Lotus Script, HTML, JavaScript & VB.

Respond to: HR Dept, Metacrest Information Systems, 15 Albergo Lane, Syosset, NY 11791.

Intelligen, Inc. a NJ IT Co., is looking for Exp. Software Engineers hvg Mast Degrees or Bach Degree w/5 yrs exp. Exp. must include combinations of Unix, C, C++, Oracle and Win NT.

Send resumes to HRD, INTELLIGEN, INC. 2326 Morse Avenue, Scotch Plains, NJ 07076.

Reinsurance Co in New York, NY seeks to fill the following positions:

Senior Systems Developer-Must have Bach in Comp Sci, Math, Physics or Engg & 3 yrs s/ware exp.

UNIX Systems Administrator-Must have Bach in Comp Sci, Electronics or Comm Engg & 3 yrs sware exp.

Senior Systems Designer-Must have Bach in Comp Sci, Math, Physics or Engg & 3 yrs s/ware exp.

Respond to: HR Dept, St Paul Re. Inc., 195 Broadway, New York, NY 10007.

Director, Records Management. Miami. Plan, develop, & administer records mgmt policies designed to facilitate handling of business records & information for a management services Co.: Standardize filing, protecting, & retrieving records/reports/information contained on paper, microfilm, computer, etc. Proof of permanent work auth. in US & MBA in MIS req'd. Competitive salary. Send resume to: D. Deppen, HR Dept., Mapholding Co., 3401 NW 82 Ave, #100, Miami, FL 33122.

Computer System Engineer wanted by Comp Support Services Firm in Rockaway, NJ. Must have BS in Comp Engg & 2 yrs exp in systematical analysis & diagnosis of h/ware & s/ware problems in DOS, Win, Win NT, Unix, OS/2 operation systems & component level analysis of voice board & prgmg of voice boards.

Respond to: HR Dept, Tech Support, Inc., 159 Route 46, P.O. Box 515, Rockaway, NJ 07866.

Chief of Information Systems for information technology management & technical consulting services company. Degree + experience required. Competitive salary.

Resume to: Structured Intelligence, Inc., Attn. Ty Barrett, 1401 Brickell Ave, Suite 1010, Miami, FL 33131.

Business Systems Analyst/Project Leader, Oviedo, FL. Provide consultancy services at client sites, including application programming; tech advice & training; programming languages, software performance; investigate software performance problems; design & implement solutions; Project leader to remediate existing programs & test applications for Y2K compl. Requires: Bachelors in Business & 2 yrs. exp. $48,000/yr., 8A - 5 P, M-F, 40/hrs. Send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, FL 32302-0869. Re: Job Order 2094937.

SYSTEMS PROGRAMMER: Responsible for all phases of development, installation and modification of computer system and application software for industry. Must have B.S. in Computer Science or equivalent, and two years experience in the job offered. Mon-Fri, 40-50 hrs/wk., $65,000/yr. plus $37.50/hr. for time in excess of 40 hrs/wk. Please send resume to Bureau of Workforce Program Support, P.O. Box 10869, Tallahassee, Florida 32302-0869. Job Order No. FL-2086894.

System Administrator needed to plan, configure, install & maintain Sun Ultra Enterprise servers & for Oracle d/base admin.

Apply to Global Consultants, 601 Jefferson Rd, Parsippany, NJ 07054.

S/ware Dvlpt & Comp Consulting Services Co in Edison, NJ seeks Sr. Programmer Analyst. Must have Bach in Engg/Sci/Comp/Electronics & 5 yrs s/ware exp.

Respond to: HR Strategic Professional Services, Inc., 505 Thornall St, Ste 304, Edison, NJ 08837.

Systems Accountant. 8a-5p. Dvlp, install & implmt comp s/ware for fin'l & accounting. Computerized paperless acctg & record keeping functions using fin'l & acctg s/ware namely Lawson Insight II Financial Suite, COBOL, Java, RDBMS, Oracle 8.0, Unix & Win OS systems in LAN or C/S envrmt. Master or equiv in Acctg, Finance, Comp Info Systms or related field. Job loc: Conyers, GA. Send resume w/r#0001 to: Vinod Jain, President, India House Brass, 1900 Sigman Rd., Conyers, GA 30012.

Forwarding co. req. computer systems analyst w/2 yrs exp to maintain and update internal computer network. Req. Bachelor's in Computer Science or equivalent.

Send resume & salary req. to HR Dept., Air Express Int'l, 120 Tokeneke Rd., Darien, CT 06820.

Associate Network Engineer wanted by California based Wireless Telecom Co for job loc in Reston, VA. Must have Bach in Comp Sci, Comp Engg or Math & 6 mos comp exp. Respond to: HR Dept, Wireless Facilities, Inc., 9805 Scranton Rd, Ste 100, San Diego, CA 92121.

Computer Systems Analyst wanted by Financial Services Co in Vienna, VA. Must have BS in Comp Sci or related field.

Respond to: HR Dept, USL Financials, Inc., 501 Church St NE, Ste 200, Vienna, VA 22180.

DATABASE MANAGER
For mid-Suffolk school district. Familiarity with COGNOS and ORACLE essential. Bachelor's degree and five years experience as programmer analyst required. Successful candidate will receive provisional Civil Service appointment and be required to take exam when given. Salary $54,150.
Resumes by July 28, 2000 to:
Ms. Louise P. Patejdl
Executive Administrative of Personnel,
EASTERN SUFFOLK BOCES
201 Sunrise Highway,
Patchogue, NY 11772

Software Engineer sought by Computer Career Placement Co. in Charlotte, NC. Must have Masters in Engg, Sci, Math or equiv & 2 yrs exp dsgng, dvlpg & testing in Oracle, SQL*Loader, SQL*Plus, Forms or PL/SQL.

Respond to: HR Dept., Baytree Associates, 4944 Parkway Plaza Blvd. Ste. 360 Charlotte, NC 28217.

Software Engineer wanted by Newspaper Publisher/Information Services Firm in Stamford, CT. Must have Bach or equiv in Comp Sci or Systms, Elec Engg or Economics & 4 yrs s/ware exp.

Respond by fax to: (203)425-1196, Attn: Maggie

Sr. Data Network Analyst wanted by Online Financial Services & Brokerage Firm in Jersey City, NJ. Must have 3 yrs computer exp.

Respond to: HR Dept, National Discount Brokers Group, Inc., 10 Exchange Place Center, 15th Fl, Jersey City, NJ 07302

Software programmer wanted by jewelry manufacturing co. in New York, NY. Must have Bach degree or equiv in Comp Sci or related field, 2 yrs exp dvlpg, modifying, implementg & maintaing comp s/ware.

Respond to: HR Dept, BH Multi Com Corp, 15 W. 46 St, New York, NY 10036.

Programmer Analyst - Sought by Clinton, IA consulting company to work in various unanticipated locations throughout the U.S. Analyze, plan, develop, test and document computer programs. Evaluate user request and software program requirement for new and modified programs. Write specifications, code, test and debug computer programs. Use of IBM AS/400, RGPIV, RPG/400, SQL/400, Query Manager, COBOL/400, PDM, RLU, SDA, MS Office, Visio, Lotus Notes and Client Access. Reqs. Bachelor's in Computer Science, Computer Engineering, Mathematics, Physics or its foreign equivalent. Plus 1 year in the job offered or 1 year in a related occupation including Programmer/Programmer Analyst or Software Engineer. $60,000/year, 40/hrs/wk, 8 AM-5PM. Respond by resume to Iowa Workforce Center, 2740 S. 17th Street, Clinton, IA 52732-7040. Refer to Job Order No. 1101068.

Systems Executive. 40hr/wk from 9 a.m. to 5 p.m. $62,000/yr. Consult with clients to ascertain and define their business requirements or problem areas. Analyze, design, develop and implement computer software for clients' MIS Systems. Analyze user requirements and applications. Design applications and databases. Develop program specifications and computer programs. Unit and System testing. Technical support. Work is done on IBM 3090 based systems using VS COBOL II, COBOL 370, DB2, CICS, TSO, ISPF, JCL, QMF, SPUFI, FILEAID and XPEDITOR. Require M.S. degree with Computer Science or Engineering (Systems and Information) as major with two years experience in job offered or as Systems Analyst with two years experience with the computer hardware and software described above. Applicants must show proof of legal authority to work in the U.S. Northwest suburb. Send resume to Illinois Department of Employment Security, 401 South State Street - 7 North, Chicago, Illinois 60605, Attention: Brenda Kelly Reference #V-IL23093-K An Employer Paid Ad. No Calls. Send 2 copies of both resume and cover letter.

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SOFTWARE ENGINEER

Designs, develops and implements database applications in the UNIX environment. Researches and applies state-of-the-art development methods to the solution of user requirements. Uses and applies thorough understanding of business systems, business requirements and user needs as well as Oracle 7.x/ 8.x database, Oracle Forms and Reports, PL/SQL, C++ and C. Documents user requirements, schedules and coordinates projects, and supports installation of software systems. Requirements: M.S. in Computer Science plus two years experience as a software engineer of database applications including use of Oracle, UNIX (Solaris 2.x) and Windows NT 4.0 operating systems. $30 to 35/hr., 40 hr./wk. Qualified U.S. workers are encouraged to apply for this position. Send two copies of resume to M. Brooks: DWE-ALC; P.O. Box 7972; Madison, WI 53707-7972 and reference case number C101625 on the application materials. EMPLOYER PAID AD.

Software Engineer - Sought by Springfield, IL consuling company to work in Clinton, IA. Research, design and develop computer software systems in conjunction with hardware product development. Consult with clients. Analyze, plan, develop, test and document computer programs including business programs. Evaluate user requests and software program requirements for new and modified programs. Write specifications, code, test and debug computer programs. Customize hardware and software to client needs. Use of UNIX, Visual Basic, MS Access, HTML, Java, and Shell Scripting. Reqs. Master's in Computer Science, Computer Engineering (any field), Business Administration or its foreign equivalent. Plus 1 year in the job offered or 1 year in a related occupation including Systems Analyst or Programmer Analyst. $55,000/year, 40/hrs/wk, 8 AM-5PM. Respond by resume to Iowa Workforce Center, 2740 S. 17th Street, Clinton, IA 52732-7040. Refer to Job Order No. 1101067.

Programmer Analyst needed for software development and consulting firm located in Duluth, Georgia. Job duties include: Analyze, design, develop, test and implement computer software applications. Consult on various in-house projects and/or contract basis throughout the United States. Use RPG/400, CL/400, SQL/400, PDM, SEU, SDA, RLU, and DFU on IBM AS/400 machine. Applicant must have 2 yrs. exp. in the job duties listed above or as a programmer, programmer analyst or consultant which includes designing and developing software applications using RPG/400, CL/400, and SQL/400 on IBM AS/400 machine. 40 hrs/wk., 8am - 5pm, Mon-Fri. $59,775/yr. Apply in person or send 2 resumes to: Georgia Department of Labor, Gwinnett Job Order #GA 6525399 1535 Atkinson Road, Lawrenceville, GA 30043-5601 or the nearest Department of Labor Field Service Office.

Full time Senior Consultant to design, develop, install and test custom software business systems utilizing C, Delphi, OS-DOS, OS/400, VM, MVS, OS/2. Must have a Bachelor's Degree in CS or related field or foreign degree equivalent. Must have one year of experience in job offered or position with same duties. Salary $72,000. Send resume to: Steve Denton IStream, Inc. 3103 Bee Caves Road, Suite 105, Austin, Texas 78746.

Project Manager (Multiple Positions: 5)

Monday through Friday; 8 a.m. to 5 p.m.; $ 61,000 annually. Required is a Bachelor of Science Degree or equivalent in Engineering, Computer Science or Math. In lieu of a formally awarded baccalaureate degree, employer will accept a combination of computer-related courses and seminars in conjunction with three (3) years of computer-related work experience substituted for each year of formal academic education lacking. Also required are three (3) years of experience in the job offered or three (3) years of related experience as a Business Analyst, Programmer/Analyst, and/or Systems Analyst. Related experience presupposes one (1) year of project management experience for computer systems projects within a financial or insurance environment. Leads a team of project leads, system analysts and programmers, networking and database professional involved in projects associated with the design and implementation of commercial information technology (IT) applications for financial institutions, insurance and manufacturing integrated automated data processing functions. Consults with internal and external users to resolve issues, builds strong relationships with users/clients, budgets, reports status, and negotiates change requests. Review requirements and high level design to evaluate effectiveness of solution in meeting the users/clients needs. Plans, directs, and coordinates activities according to the SEI's Capability Maturity Model (CMM). Creates Project Definition Book which defines the scope, objective, and constraints of the project. Defines project management details such as issues and defect tracking, change management processes, and review & sign-off processes. Creates the work plan for each phase of the development life-cycle, selects and schedules team members and leads team by assigning duties, responsibilities, and scope of authority to team members. Utilizes COBOL, COBOL II, IMS DB/DC, DL1, DB2, SQL, VB 5.0, Britrieve, PL1, SUPRA on large scale mainframes utilizing MVS operating systems and Client Server, NOVELL and UNIX platforms. Utilizes project management tools that include MS Project, MS Word, MS Excel, and e-mail for documenting, budgeting, communicating, and tracking. Must have proof of legal authority to work permanently in the United States. Interested applicants submit two (2) resumes with reference to cases C101609 & C101610 to: Mike Brooks, DWE-ALC, P.O. Box 7972, Madison, WI 53707-7972.

Cybersoft Technologies, Inc.

Cybersoft Technologies, Inc., is a software consulting company providing solutions on a wide range of applications from desktop to enterprise level. We are looking for the following positions:

Software Engineeers (Main Frame):

This position involves research, analysis, design & development of Mainframe and/or Multi-tier Architecture enterprise level systems. Knowledge of Database Design with expertise in implementing enterprise level Data Warehouse & Data Mart's. Some experience in Data Modelling & Legacy System conversion is preferred. Requires Masters degree in Computer Science or equivalent and 1 + year's experience.

Software Engineers (Java)

This position involves research, analysis, design, and development of Internet programs for Web-based knowledge management, customer relationship Management, sales force automation, and e-commerce. Knowledge in Java and HTML programming is preferred. Requires Masters in Computer Science OR equivalent and 1 + year's experience.

Programmer Analyst:

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Programmer Analysts:
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Senior Software Engineer (Boulder, CO) -Specify, design, develop, and implement algorithm based and object oriented software system components utilizing algorithms, C, C++ design and coding skills, Windows, Windows NT and UNIX environments. Must have Bachelor's degree or foreign degree equivalent in Computer Science, Engineering or related field and 3 years experience in job offered or 3 years experience in software development position with same duties as job offered. Salary $90,000/year. Must have proof of legal authority to work in the U.S. Submit resume to Colorado Dept. of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Ste 400, 1515 Arapahoe Street, Denver, CO 80202-2117, and refer to Job Order No. CO4665979.

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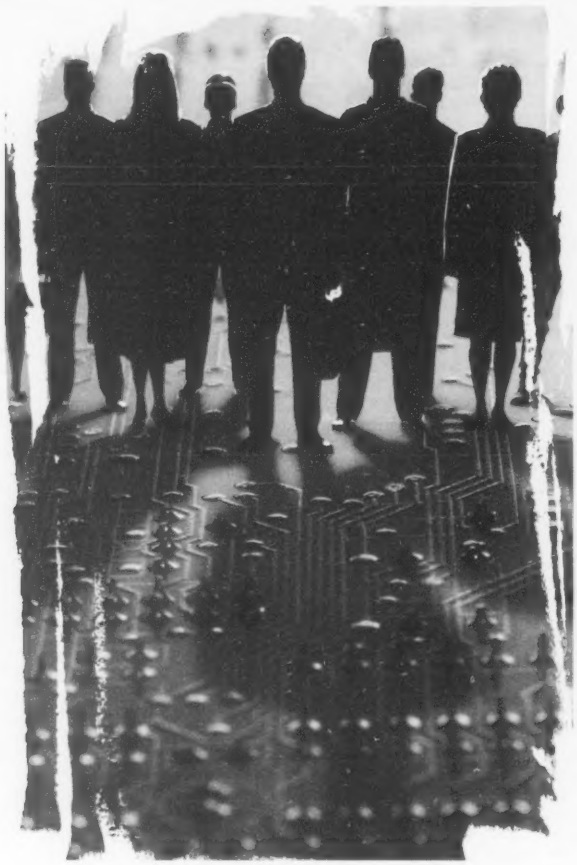

There was a time when information technology consulting was just that – what kind of mainframe to buy, install it and provide basic training. Other firms provided staff augmentation, hiring out project managers and IT expertise for "engagements." Today, IT consulting is a mix of complexities focused primarily on resolving business issues and challenges, and only afterward do 21st century consultants apply technology to resolve the issues.

Just as the requirements from clients have changed, so too have the requirements of the consultants. Successful firms are offering employees a chance to choose assignments, to work closer to home and to achieve a better balance between work and personal life.

Ajilon LLC
Conshohocken, PA

With approximately 5,000 consultants located around the globe, Ajilon LLC has developed the ability to cater to multiple markets, multiple industries and multiple business issues. "We deliver services to locations worldwide and assist our clients with solutions for implementation through systems transformation and functional outsourcing," explains Evelyn Meltzer, senior technical recruiting manager for Ajilon. This expansive range of technology services means that Ajilon can address legacy system requirements and provide tools and methodologies to solve business problems.

The problem-solving capability is the biggest challenge, but also the greatest opportunity for Ajilon to bring value to its clients. "We also have clients who want the entire service – functional outsourcing, systems transformation, application development, maintenance and ongoing support," Meltzer says. The company currently is looking for employees with a wide variety of skills, such as client/server developers, project managers, web developers, Internet specialists, network administrators, desktop support and more.

"When I look at a resume, I look for the type and duration of assignments and employment history," Meltzer says. "These are factors that are important to my overall evaluation of the candidate. We are looking for people who enjoy the diversity of consulting, the flexibility of moving from client to client without changing employers, and who have demonstrated an interest in expanding their own capabilities."

Ajilon is concerned with its consultants' career growth. There is an ongoing process for keeping in touch with what consultants need, what they are looking for in the future and how Ajilon can help them reach their goals. "We hire consultants whose characteristics are consistent with those of Ajilon: talented, committed and motivated to succeed in a competitive environment," says Meltzer. Ajilon offers a wide range of benefits to its employees, including medical, dental, vision, retirement plan, life insurance, disability coverage and tuition reimbursement of $2,500 per year.

"We have found that most people who come to work at Ajilon stay here," Meltzer adds. "Our rapid growth exemplifies the qualify of our IT professionals. Ajilon has consultants in more than 80 cities in the United States, as well as Canada, the United Kingdom and Australia. Consultants are assigned within the area where they are hired.

Andersen Consulting
Washington, DC

The big five consulting firms have long been known as the training ground for the industry's leaders. However, Andersen Consulting set about reinventing itself to attract and keep the best consultants anywhere. Where the companies in the past focused on strategic planning and market growth, today Andersen Consulting has reinvented itself to be a leader in e-commerce strategy and implementation for clients.

Among the fastest-growing areas of Andersen Consulting are its 24 dot-com launch centers around the world. These centers are unique, post-incubation e-business studios designed to dramatically reduce the time it takes an initially funded start-up to achieve sustainable success. Andersen Consulting has already worked with more than 350 dot-com start-ups and spin-offs. "Andersen

IT Careers in Consulting

Consulting offers the best of both worlds, meaning the opportunity to work in this fast-paced, very volatile market of dot-coms while still being able to take advantage of the global reach and security of such an established firm as Andersen Consulting," explains Angel Harmon, U.S. director of recruiting for government and global market operations.

A second change made at Andersen Consulting is providing employees with a stake in the firm. "We are investing $200 million in e-commerce-related companies on behalf of our employees through AC Ventures, the firm's venture capital unit, and intend to subsequently continue to invest another $100 million each year," explains Harmon. "The wealth created by these investments will be distributed to employees as 'Eunits' (employee units) – a unique and proprietary form of compensation that harnesses the value of the electronic economy. The company also redefined its partnership program and plans to double the number of partners this year. The idea is to make this level accessible to employees much earlier in their careers."

In addition, Andersen invested $1.3 billion in training, research and development in 1999, a level Harmon expects to continue to grow as the company continues to grow. "We work directly with our employees to identify training goals and appropriate programs. The result is that we can offer the best of both worlds – a wide breadth of career opportunities with both top established companies, as well as with start-ups and spin-offs" says Harmon.

"We are looking for people with e-commerce skills who also have experience in the consulting field," adds Harmon. "That experience might be in front-end operation, middleware, as application developers or as system architects." Andersen Consulting works in five major industries. These include government, resources, financial services, communication and high technology and products. Andersen Consulting is hiring in almost every worldwide location, including more than 40 offices in the United States.

Best@IT Inc.
Freehold, NJ

Raymond Arello, CEO at Best@IT Inc., looks at the information technology arena and notes one statistic that towers above all others: 844,000 open jobs. "At Best, we have the ability to meet staffing needs with talent from a global marketplace," says Arello. "Our role as part of our parent company, Best International Group (of the UK), is to provide U.S. companies with access to IT professionals and staffing solutions on a global scale."

Best@IT works with a wide range of clients. One sample client that depicts a wide range of Best's Services is Nortel Networks. "With Nortel, we provide network engineers and equipment installers, on a contract basis, who are involved in the roll out of new Nortel products," says Arello. Best also recruits and trains IT professionals to become Nortel Network Certified Support Specialists. Candidates who successfully complete this highly intensive no-cost program are offered employment opportunities with Nortel Networks in systems engineering, technical troubleshooting, design architecture or sales engineering roles.

"Some other industries that we are actively involved in include financial services and the entertainment industry. In both of these cases, we fulfill contracts in which we provide project managers, business analysts and system developers. From a technology standpoint, the hottest areas are those in which we develop web applications and tools for our clients," adds Arello. "The biggest difference in the two years since we've started operations in the United States is the pace. In the past, developing mainframe solutions took two to three years from identification to implementation. Today we're operating at e-speed, taking three to six months to develop and implement new systems."

Arello says the Internet increasingly plays a role in Best's recruiting efforts. "We data mine and post to the job boards, as well as work with direct recruiting and referrals," he says. "The Internet provides a much more global candidate base for our clients."

The company looks for technical skills that include JAVA, HTML, web development, network engineering, ASP and object-oriented design and development. "More and more we need people who understand how to work in a business environment and who can then utilize the technologies to provide the solutions needed," Arello says. "I'm not sure titles or labels for positions work anymore. Instead, we need people who are business and data knowledgeable. Data is the most critical asset an organization possesses and that's where our emphasis is focused. We also are providing solutions that span across the entire enterprise, not just front-end or back-end. Our clients don't want to know what makes it all work together. They want to know that it does."

Best@IT has offices in New York, New Jersey, Los Angeles, Seattle and Dallas. "You'll want to be part of Best because of the projects we're involved with. Our clients are working on the edge, and we're there with them, helping to push that edge forward. Furthermore, because we are out on the edge, pushing at new technologies and operating paradigms, we must be more than competitive in terms of pay and benefits," says Arello.

Complete Business Solutions, Inc. (CBSI)
Portland, OR

Complete Business Solutions, Inc., headquartered in Farmington Hills, MI, was formed 15 years ago. However, two years ago the company took a sharp turn, linked to the emerging uses of the Internet and web, acquiring and merging with several other firms. Today, CBSI provides full life-cycle e-business consulting for middle-tier clients, from startups to those with $2-4 billion a year in revenues.

"Here in the Pacific Northwest, we focus on serving the Northwest in e-business, data warehousing and development of IT strategies to resolve business issues," says Mike Ryan, vice president for the Pacific Northwest Region. "Our e-business sector runs the gamut, from basic dot-coms that need a site up and running to business-to-business and business-to-consumer sites and replatforming legacy systems to new technologies."

CBSI currently is in need of skills across the full life-cycle of an e-business engagement. Senior architects are needed to set the overall solution direction of a project, based on experience across multiple technologies. "The senior architect dialogues with the clients to understand their objectives and lay out pros and cons of different technological paths that could be taken," explains Ryan. Managing the project from beginning to end is a project manager, familiar with the iterative orientation of RUP (rational unified process). Other needs include analysts with UML methodology background, junior architects to develop detailed specifications and design, and developers to build the application code. Finally, testers are needed to assure the system does what it is supposed to do.

CBSI works with a variety of clients, including manufacturers and healthcare institutions. "Most of our clients are of medium size in the middle-tier and look to us to work with them to deliver their major information technology projects," says Ryan. "They expect us to turn the project for them, from strategy through project delivery to knowledge transfer and setting up ongoing maintenance."

In the Pacific Northwest region alone, CBSI plans to hire approximately 50 people in 2000. "It's a fun place to work, with fun people. People at CBSI have the enthusiasm and positive attitude that keep our business going," adds Ryan.

IT Careers in Consulting

"We offer a flexible environment, focused on giving people projects where they will be challenged, where they can push the envelope and still have a sane lifestyle that balances client/business and employee needs."

Corio, Inc.
Redwood City, CA

Most people know Corio, Inc. as an application service provider, supplying support and applications for myriad business requirements. Corio Consulting,however, is a second function of the company, providing implementation, customization and general consulting to businesses whether they have an ASP contract or not.

Andrea Holko, vice president of consulting/Western region, says the consulting challenges range from aligning IT with business needs to total system development and implementation. "Many times our work is about taking a start-up business from the point where it's using a simple bookkeeping application into full growth mode operation. Our clients look to us to understand the impact of dimension and scale as they position themselves for growth."

Holko is looking for a variety of skills, including mature consulting capability. "It also helps to have a large systems development, implementation and project management experience, and a background in managing a large, complex client relationship," she says. "Our niche is in providing rapid implementation sometimes in just four weeks, so it's important that people understand life-cycles of businesses and products and then apply that knowledge in a light-speed environment." Specific skills needed include an understanding of the technical underpinning of the applications Corio supports, Peoplesoft, SAP SIEBEL, C1, Broadvision MOAI and other e-commerce tools for commerce development and integration, as well as a deep functional knowledge of the software and the business process which support those applications.

To add value in the traditional consulting and ASP markets, Corio Consulting focuses employees on customer satisfaction and repeatable business. "Because of the way we work, our consultants need to have an understanding of a broad range of business functions and applications. Cross training is necessary," says Holko. "The culture is entrepreneurial, and our work allows us to make a significant impact on our clients' operation."

DMR
Edison, NJ

DMR Consulting has about 9,000 employees, all helping their customers develop everything from e-commerce applications to customer response management systems. However, the company also provides a fair amount of outsourcing service to clients. "We've found that customers find it difficult to maintain applications in a cost-effective manner, so they outsource," explains John Wighton, vice president-resource management for DMR Consulting in the United States.

DMR Consulting has 26 offices across the United States, 14 offices in Canada and another 25 offices throughout the United Kingdom, the Netherlands, Spain, Australia and Kuala Lumpur. DMR Consulting distinguishes itself as one of the top 25 international IT consulting groups in the world, providing services to aerospace, banking, telecommunications and pharmaceutical industries. "We are a best option for people interested in growing technical careers on a worldwide basis," says Wighton. "We can offer you challenges in a variety of directions."

Beginning on day one, DMR Consulting employees are paired with a career adviser. "This is a complex career, and we try to make sure DMR Consulting works for you," says Wighton. Each career advisor works with just five employees. "They'll challenge your ideas and strengths so that you get the most benefit from opportunities. Advisors also help you as we match projects to your needs." In fact, DMR Consulting has an online system that helps match employees to the available assignments. Employees will be able to bid on assignments themselves in the next release of software.

DMR Consulting is looking for people with web development and industry experience. "We look for team players and positive attitudes. That's hard to draw out on a resume," says Wighton. "We've found that team players provide the best long-term solutions for clients and have the best track record with us."

DMR Consulting expects to hire another 1,000 consultants over the next 12 months. "The demand is tremendous, so it's an aggressive target," says Wighton. "DMR Consulting is interested in having an open dialogue with the people who work here, giving them choices is what employees want. We are a company that likes to catch people doing good things, and that's a big change from standard business operations."

Diamond Technology Partners
Chicago, IL

In 1994 Diamond Technology Partners began business as a strategy firm, helping businesses deal with technology as a disruptive force. Today, as the Internet has taken hold, the group still focuses on strategy but is committed to also developing "killer apps" with clients.

Anthony Abbattista, a partner at Diamond Technology Partners and head of its Diamond Marketspace Solutions Practice, says the company moved from helping clients on profit-improvement methods and processes to identifying, building and launching e-businesses on an accelerated timeline. "We remain trusted strategic advisors, but we also focus on end-to-end delivery of e-business potential," explains Abbattista.

Diamond Technology Partners works in the communications, media, financial services, healthcare and products markets. In addition to developing strategies and applications, the group also is working with multi-company clients to develop online exchanges involving industrial products. Diamond works with clients in both the B2B and B2C arenas.

Among its clients is Simon Properties Group, the largest publicly traded retail mall developers in North America. "We are working with the group to leverage all the bricks and mortar through the Internet," says Abbattista. "We've helped them construct their own incubator to test new ideas and infrastructures. FastFrog.com is one of the results of that incubator – an appeal to teenagers who basically can prepare a virtual registry or wish list that uses the mall as a delivery mechanism."

A similar development has been YourSherpa.com – it's a service for those people who would like to buy more than they can carry away from a mall. Targeted at the mature shopper with disposable income, the program provides shoppers with a zapper that they use to identify their shopping list. It's uploaded, can be gift-wrapped and even delivered when and where they want.

"We want to work with industries where we can be innovative and where the work will be interesting for our employees," says Abbattista. "Our clients are doing spin outs or carve outs of their businesses and are working at a furious pace to get there."

Diamond Technology Partners is looking for smart people, in terms of street smarts and book smarts. "We need people who are naturally curious and who want to expand their scope – the technologist who is also interested in the financial end of a new business and who likes to tinker," says Abbattista. "We pay well, but more important is that we treat one another well and expect people to work on their own destiny."

IT Careers in Consulting

Technical skills needed include technology media, web-based technologies, and raw talent and aptitude. "In the past we didn't hire less than an MBA, but today we're doing undergraduate recruiting in addition to experienced hiring. As we blend together our culture, curiosity and smart people, we put a lot of value on having fun. You can choose to be a knowledge leader or a project leader on everything from value delivery to programming teams to research."

Diamond Technology Partners plans to hire more than 200 new practice employees in 2000, up from approximately 550 today.

Omicron Consulting Philadelphia, PA

Omicron Consulting is a premier e-business consulting firm concerned about relationships, not projects. "We attract the most qualified people who want to work with cutting-edge technologies and the most advanced tools," says Valerie DeRusso, chief operating officer for Omicron. The company performs a variety of services, from helping companies establish an e-vision plan for their businesses, to software and e-commerce application development, network infrastructure design, deployment, training and customer support.

"People who apply to work for Omicron are highly motivated people who want to work with the latest technology and need the excitement of something new, moving from assignment to assignment for variety," says DeRusso. She notes that the company isn't married to any one technology for clients, but encourages research and development in technologies that truly meet client needs.

Omicron provides services to the food service, pharmaceutical, utility, entertainment, retail, chemical and manufacturing industries. "We need people with vision, who have management consulting experience, and who can apply technology to a vertical market," adds DeRusso. "We are continually researching new tools and technologies, building prototypes and establishing where to go next from a technology perspective."

As with more and more of the attractive employers, Omicron isn't interested in people with less than a two-year stint somewhere. "We look for how you have leveraged your skills, your stability with previous employers, and your ability to adapt to new technologies and business drivers," says DeRusso.

DeRusso says Omicron doesn't participate in bidding wars for highly talented individuals. "Money does not buy loyalty," she says. "Omicron is a place where the environment is strong, where employees understand the job to be done and they do it. They have families and commitments, which means we have to be very flexible. We make sure people are paid and rewarded for the work they do." In addition to base pay, employees receive bonuses based on performance on at least a quarterly basis (sometimes more frequently, depending on the customer's goals and needs). Employees are also eligible for discretionary and project bonuses. She believes one of the strongest selling points for Omicron is the loyalty employees have for the firm and the loyalty the firm has for its staff. "We understand what showing appreciation means to people. We know one another, and as a company we're committed to helping people personally and professionally."

Privately held, Omicron anticipates a 15 percent jump in employment in the year 2000.

Webb Information Services Minneapolis, MN

Todd Webb, CEO of Webb Information Services, talks about consulting as if he's coaching a baseball team. "The company was founded two years ago because I saw an opportunity," he says. "The players in the consulting businesses and whose uniforms were getting dirty were not given the flexibility or compensation they deserved. Our goal is to allow the players who are winning the game to be treated fairly and to be compensated accordingly."

A 15-year consulting veteran, Webb developed a business model in which people are technically challenged, working with leading companies on front-edge problems. "The difference is that we wanted employees to be able to achieve their financial goals and have complete control of their careers." To do so, Webb offers different types of employment: traditional employment with base pay, benefits and holidays; and hourly employees who receive full benefits but no vacation – they are paid for what they work while still having benefits. "They receive 70 percent of what we bill to our clients," explains Webb. "Partnering with employees is a reality here."

Because of this business model, Webb had to add some features for employees. Training and certifications are made available, based on what clients need. "We also assign a dollar amount to billables that is allocated for training in whatever the employee wants, whether it's a conference, tuition, software or whatever. This puts the consultants in control of their training, with a budget to select what interests them."

The last piece of the game strategy for employees is that they choose their own engagements. "We present a project or company to the employees – the location, responsibilities, money – and they decide whether it's a fit," says Webb. "It's a real change that is a plus for our customers – our consultants are working with them because they want to be there."

Webb provides four services: consulting and software development, value-added resale of software and hardware, system integration, and full-time placement of outsource employees with clients. "The consultants who work here like the package because it attracts the kinds of clients they want to work with," says Webb.

Among these are BestBuy and BestBuy.com. Currently, Webb Information Services is developing an e-commerce application and ERP implementation for the corporation. For SuperValue retailer, the company is consolidating 35 separate applications into one that is Java and Java Bean based.

"We look for three things in recruiting," Webb says. "We look at the type of applications you have experience with, particularly for e-commerce, web-enabled tools, intelligence and ERP. We also look at the tools you've used to design solutions – we are big into object-oriented, visual studio set, Java, relational database, NT and UNIX. The third thing is who you've worked for in the past and their technology focus."

Webb believes talented people want to work in the type of environment he's creating. "And you'll have the opportunity to work on applications at the forefront of today's market. You'll be working with clients like Lucent, American Express and Cargill. But mostly, we believe you'll like our business model, where you're in control of the whole process."

For more job opportunities with consulting companies, turn to the pages of IT Careers.

Interested in IT Careers?

If you'd like to take part in an upcoming IT Careers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.

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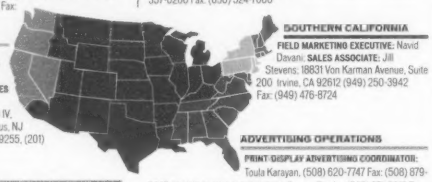

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Analysts Mixed About IBM's Future

Some urge caution; others see double-digit growth

BY PIMM FOX

OK, LET'S ADMIT IT: The news hasn't exactly been good for companies involved in the mainframe business.

Electronic Data Systems Corp. (NYSE:EDS), Computer Sciences Corp. (NYSE:CSC), Unisys Corp. (NYSE:UIS), BMC Software Inc. (Nasdaq:BMCS) and Computer Associates International Inc. (NYSE:CA) have all warned investors that their companies' performances for this quarter are way off projections.

So where does this leave investors in IBM — the bellwether of the industry — who have already seen a 5% decline in revenue for the first quarter?

Wall Street analysts interpret IBM and its future performance in contrasting ways. Don Young, who watches IBM for Weehawken, N.J.-based Paine-Webber Inc., urges caution on the company, "given near-term weakness in global services."

He says he anticipates global service revenue growth of 5% for the second quarter and "would not be surprised if the company reports even weaker numbers — as little as no growth."

Services have been IBM's growth engine, posting revenue gains of 15% in last year's second quarter. Estimates for the current quarter range from 8% to 14%.

"The hardware segment is fraught with extremely difficult year-ago [comparisons], specifically, hardware revenue growth of 22% in the second quarter of 1999," Young says. The revenue shortfall in this year's first quarter was due to a decrease in hardware sales.

Other analysts have come to slightly different conclusions.

Toni Sacconaghi, an analyst at New York-based Sanford C. Bernstein & Co. Inc., acknowledges that comparing this year's results with last year's is difficult because of Y2k-related demand distortions and falloffs in revenue and profits.

But Sacconaghi says he believes that IBM will deliver on the "Big 3."

"I think they will post double-digit revenue growth, above-consensus earnings per share and will register strong MIPS growth," says Sacconaghi.

Stephen R. Weber, an analyst at SG Cowen Securities Corp. in Boston, says he sees a recovery in IBM's OEM business. And while he expects lower revenue in the second quarter, e-commerce-led services and software sales should facilitate stronger growth after the second quarter. ◗

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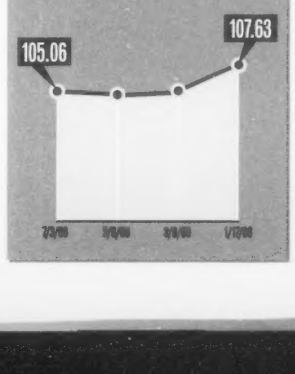
Watching Big Blue

IBM's closing stock prices in 2000:



EXCH	52-WEEK HIGH	52-WEEK LOW		JULY 14 2 PM	WK NET CHANGE	WK PCT CHANGE
SOFTWARE UP 3.8%						
ASWX	149.12	11.00	Active Software	87.50	8.75	11.1
ADBE	143.31	40.40	Adobe Systems Inc. (H)	136.56	1.09	0.8
ARBA	183.34	16.56	Ariba Inc	127.06	35.06	38.1
AZPN	55.37	8.12	Aspen Technology Inc	36.31	3.56	8.9
ADSK	56.06	17.00	Autodesk Inc.	23.68	-9.81	-29.1
AVID	70.56	8.75	Avid Technology	10.13	-1.13	-10.0
BAANF	16.25	1.12	Baan Co. N.V.	2.41	-0.09	-3.8
BMCS	86.62	19.75	BMC Software Inc. (L)	19.94	2.06	9.4
BOBJ	150.87	17.93	Business Objects S.A.	82.38	6.88	7.1
CDN	74.62	6.18	Cadence Design Systems	27.75	2.69	10.4
CHKP	295.00	26.06	Checkpoint Software Tech. Ltd.	234.63	9.19	4.1
CTXS	122.31	17.50	Citrix Systems Inc.	21.38	0.56	2.7
CGNX	46.50	9.68	Cognex Inc. (H)	41.75	0.50	1.2
CA	79.43	27.50	Computer Assoc. Int'l Inc. (L)	28.75	1.31	4.8
CPWR	40.00	8.59	Compuware Corp. (L)	8.97	-1.47	-14.1
DCTM	105.00	12.18	Documentum	90.38	0.31	0.3
EFII	89.31	22.00	Electronics For Imaging	27.81	3.75	15.6
HNCS	130.00	29.56	Hnc Software	57.31	2.63	4.8
HYSL	65.00	15.12	Hyperion Software	32.50	0.00	0.0
IDIX	49.12	10.37	IDX Systems	16.56	1.94	13.2
INFA	110.87	16.06	Informatica Corp.	85.25	3.44	4.2
IFMX	21.25	4.25	Informix Software Inc. (L)	3.69	-1.09	-22.8
INTU	90.00	22.50	Intuit	42.25	2.50	6.3
JKHY	53.00	15.50	Jack Henry Associates	47.59	-1.72	-3.5
JDEC	48.31	10.25	J.D. Edwards & Co.	15.31	0.13	0.8
LSTOE	82.50	9.25	Legato Systems Inc.	12.00	-2.56	-17.6
MACR	114.75	27.37	Macromedia Inc.	111.75	15.63	16.3
MANU	70.25	9.06	Manugistics Group Inc.	59.50	14.25	31.5
MENT	21.00	7.75	Mentor Graphics (H)	19.88	0.38	1.9
MSFT	119.93	60.37	Microsoft Corp.	79.00	-3.31	-4.0
NETA	37.18	14.43	Network Associates	23.44	2.56	12.3
NTAP	164.50	26.00	Network Appliance	67.00	11.00	19.6
NOVL	44.56	7.87	Novell Inc.	9.53	0.06	0.7
ORCL	90.00	17.34	Oracle Corp.	76.06	0.19	0.2
PMTC	35.93	7.37	Parametric Technology Corp.	12.50	0.94	8.1
PSFT	27.75	12.00	PeopleSoft Inc.	20.63	2.88	16.2
PIXR	50.37	32.20	Pixar	36.00	0.00	0.0
RATL	113.75	26.37	Rational Software Corp. (H)	105.50	13.75	15.0
RHAT	151.31	7.00	Red Hat Inc.	24.56	-0.06	-0.3
QSFT	98.12	7.00	Quest Software	53.69	11.56	27.2
SAP	85.93	29.37	SAP AG	52.00	5.56	12.0
SCUR	29.62	2.31	Secure Computing Corp.	17.25	0.69	4.2
SDRC	20.00	8.81	Structural Dynamics Research	15.19	0.38	2.5
SYBS	31.00	8.50	Sybase Inc.	22.00	-0.75	-3.3
SYMC	81.62	25.37	Symantec Corp.	53.38	2.00	3.9
SNPS	75.62	32.00	Synopsys (L)	32.50	3.31	9.2
SCTC	28.37	10.00	Systems & Computer Technology	18.25	0.94	4.9
TIBX	147.00	25.00	Tibco Software Inc.	127.63	12.19	10.6
TSAI	48.12	11.37	Transaction Sys. Architects	21.06	4.19	24.8
VRTS	174.00	20.63	Veritas Software Corp.	134.63	15.00	12.5
WIND	66.12	13.37	Wind River Systems Inc.	34.38	3.13	8.3
TELECOMMUNICATIONS CARRIERS UP 3.8%						
T	91.81	55.87	Alltel Corp.	61.88	2.50	3.9
ANDW	42.06	11.18	Andrew Corp.	22.13	1.88	8.2
T	61.00	31.25	AT&T	33.00	0.00	0.0
BCE	137.50	21.06	BCE Inc.	25.00	-0.13	-0.5
BEL	69.50	47.37	Bell Atlantic	50.81	0.00	0.0
BLS	53.50	34.93	Bell South	40.75	-1.75	-4.1
BRW	41.06	16.31	Brunswick Bell Inc.	29.56	2.56	9.5
CMCSK	57.68	27.87	Comcast	37.69	1.88	4.7
CQ	37.06	15.31	Comsat Corp.	26.13	1.25	5.0
COX	58.37	34.25	Cox Communications Inc.	43.13	0.81	1.8
GSTRF	53.75	5.81	Globalstar Telecom. Ltd.	10.63	3.00	39.3
GTE	78.50	55.81	GTE Corp.	62.25	0.00	0.0
NXTL	82.93	22.68	Nextel Communications	72.19	9.50	15.2
SPOT	74.25	32.87	Panamsat	40.94	3.81	9.5
QCOM	200.00	33.96	Qualcomm	64.00	6.88	12.0
SBC	59.87	38.81	SBC Communications	44.75	0.25	0.6
FON	75.93	42.62	Sprint Corp.	49.63	2.94	5.6
TDS	137.00	65.87	Telephone and Data Systems	121.50	13.88	12.9
USW	92.87	51.75	US West	85.75	0.00	0.0
VIA	71.37	38.43	Viacom (H)	70.81	2.38	3.5
WCII	66.50	24.00	Winstar Communications Inc.	40.00	1.66	4.3
WCOM	61.33	35.87	MCI Worldcom Inc.	49.06	1.94	4.1
SERVICES UP 2.9%						
ACXM	35.93	14.56	Acxiom Corp.	29.50	0.63	2.1
ACS	53.00	31.00	Affiliated Computer Servs.	36.50	3.06	9.2
AMSY	44.37	19.75	American Mgt. Systems	33.00	0.81	2.5
AUD	57.93	37.37	Automatic Data Processing	53.13	0.75	1.4
BSYS	69.00	41.37	Bisys Group Inc.	61.38	0.38	0.6
CATP	77.00	8.75	Cambridge Technology Ptnrs	8.03	0.09	1.2
CEN	33.25	14.75	Cendant	24.25	0.88	3.8
CBR	29.81	10.87	Ciber Inc. (L)	10.94	1.31	10.7
CDO	57.25	17.43	Comdisco	26.88	4.88	22.2
CHRZ	27.12	10.37	Computer Horizons Corp.	12.81	0.31	2.4
CSC	99.87	57.93	Computer Sciences	72.13	1.75	2.5
DST	85.37	51.18	Dst Systems Inc.	82.44	3.81	4.8
EDS	76.68	38.37	Electronic Data Systems	41.56	1.38	3.4
FDC	57.68	38.93	First Data Group	47.75	2.19	4.8
FISV	50.37	24.12	Fiserv	44.94	1.31	3.0
IT	23.37	9.56	Gartner Group	13.69	1.63	13.5
KEA	35.00	18.06	Keane Inc.	24.31	1.25	5.4
NDC	52.06	20.75	National Data	25.75	3.06	13.5
PAYX	44.25	15.70	Paychex Inc.	42.31	-0.13	-0.3
PFE	29.50	9.31	Perot Systems Corp.	10.81	-0.38	-3.4
REDI	9.75	1.29	Renaissance Worldwide (L)	1.31	0.62	32.3
REY	33.00	16.62	Reynolds & Reynolds (L)	19.00	1.13	6.3
SFE	99.00	15.85	Safeguard Scientifics	36.31	5.50	17.9
SAPE	151.18	23.87	Sapient Corp.	120.03	20.97	21.2
SDS	40.00	16.87	Sungard Data Systems	30.31	3.31	12.3
SYNT	20.93	7.87	Syntel Inc.	9.63	-0.31	-3.1
TECD	49.75	18.00	Tech Data (H)	49.38	4.50	10.0
TENF	76.87	7.50	TenFold Corp. (L)	11.06	-5.56	-33.5
TSS	20.62	14.12	Total System Services Inc.	16.19	0.31	1.7
TSAI	48.12	11.37	Transaction Sys. Architects	21.06	4.19	24.8
NETWORK UP 10.4%						
COMS	119.75	22.62	3Com Corp.	70.38	14.25	25.4
ADCT	85.12	17.18	ADC Telecommunications Inc.	78.69	0.56	0.7
ANTC	61.25	23.25	Antec	49.00	7.31	17.5
CS	52.75	11.12	Cabletron Systems	29.56	4.13	16.2
CNEBF	6.75	1.61	Call-Net Enterprises (L)	1.88	0.50	21.1
CSCO	82.00	26.07	Cisco Systems Inc.	67.69	2.69	4.1
ECIL	39.50	23.75	ECI Telecom	38.69	2.56	7.1
ENTU	150.00	16.31	Entrust Technologies Inc.	33.69	1.81	5.1
EPRE	40.56	6.25	ePresence Inc.	8.06	0.84	11.6
HRS	39.75	15.50	Harris Corp.	37.31	2.69	7.8
GMH	46.68	16.25	Hughes Electronics/GM	33.44	2.69	8.7
ERICY	26.31	6.87	LM Ericsson	22.56	0.94	4.3
JNPR	177.00	20.33	Juniper Networks Inc. (H)	173.50	24.50	16.4
LU	84.18	49.81	Lucent Technologies	62.25	5.75	10.2
MADGF	17.37	1.43	Madge Networks	4.13	0.50	10.8
NCDI	9.62	1.03	Network Computing Dev.	2.13	1.00	88.9
NWK	14.81	7.31	Network Equipment Tech	10.31	0.06	0.6

EXCH	52-WEEK HIGH	52-WEEK LOW		JULY 14 2 PM	WK NET CHANGE	WK PCT CHANGE
NOK	62.50	19.26	Nokia Corp.	55.06	1.63	3.0
NT	79.00	19.90	Northern Telecom Ltd. (H)	79.00	7.50	10.5
PCTL	15.21	1.87	Pictureteł	3.50	0.47	15.5
SFA	90.37	16.90	Scientific Atlanta (H)	66.75	1.81	2.1
TLAB	77.25	41.81	Tellabs Inc.	75.69	2.13	2.9
USW	92.87	51.75	US West	85.75	0.00	0.0
VRLK	22.00	1.81	Verilink	11.00	0.00	0.0
WSTL	40.75	6.43	Westell Technology Inc	24.81	7.50	43.3
SEMICONDUCTORS, CHIPS & EQUIPMENT UP 5.6%						
ADPT	63.56	15.37	Adaptec Inc.	20.38	-0.56	-2.7
AMD	97.00	15.62	Advanced Micro Devices	87.13	6.13	7.6
ALTR	120.06	35.06	Altera	120.06	16.19	15.6
ADI	100.00	20.81	Analog Devices	85.69	9.44	12.4
AMAT	116.00	31.12	Applied Materials	88.69	1.13	1.3
ASML	50.25	17.93	ASM Lithography Holding	45.75	3.88	9.3
FCS	49.50	18.50	Fairchild Semiconductor Corp.	40.19	2.88	7.7
HRS	39.75	15.50	Harris Corp.	37.31	2.69	7.8
INTC	146.37	62.75	Intel Corp.	144.00	5.00	3.6
KLAC	97.75	29.90	Kla Instruments	61.38	7.13	13.1
LLTC	74.75	27.62	Linear Technology	67.75	3.81	6.0
LSI	90.37	21.56	LSI Logic	57.81	1.69	3.0
MXIM	77.68	30.03	Maxim Integrated Products	74.75	2.31	3.2
MU	96.37	20.31	Micron Technology (H)	94.19	6.94	8.0
MOT	61.54	27.33	Motorola	38.50	5.69	17.3
NSM	85.93	22.06	National Semiconductor	53.31	0.56	1.1
STM	73.87	21.27	SGS-Thomson Microelectronics	65.38	1.88	3.0
SLR	49.50	28.25	Solectron Corp.	47.06	2.56	5.8
TER	115.43	26.93	Teradyne	74.25	5.25	6.6
TXN	99.78	33.54	Texas Instruments	71.06	1.38	2.0
JDSU	153.42	19.31	Uniphase	109.19	6.06	5.3
VTSS	115.68	28.59	Vitesse Semiconductor Corp.	74.94	1.75	2.3
XLNX	98.31	28.68	Xilinx	95.06	8.44	9.7
COMPUTER SYSTEMS UP 3.5%						
AAPL	75.18	25.43	Apple Computer Inc.	57.63	3.63	6.7
ASPX	19.00	3.87	Auspex Systems	4.84	-0.28	-5.5
BEOS	39.56	3.28	Be Inc.	4.00	-0.50	-11.1
CPQ	34.00	18.25	Compaq	27.69	2.31	9.1
DELL	59.68	35.00	Dell Computer Corp.	53.00	3.25	6.5
GTW	84.00	28.37	Gateway 2000 Inc.	59.88	4.13	8.7
HWP	155.50	67.00	Hewlett-Packard Co.	134.50	10.44	8.4
HIT	164.50	91.00	Hitachi Ltd.	129.81	-3.63	-2.7
IBM	139.18	89.00	IBM	103.31	0.63	0.6
MUEI	20.68	8.18	Maxon	11.75	0.19	1.6
MOT	61.54	27.33	Motorola	38.50	5.69	17.3
NATI	59.50	25.50	National Instruments Corp.	49.38	5.88	13.5
NCR	52.62	26.68	NCR	39.31	1.00	2.6
NIPNY	162.00	62.75	NEC	152.50	4.00	2.7
PRCM	89.75	5.62	Procom Tech Inc.	56.25	-2.75	-4.7
SGI	19.87	3.06	Silicon Graphics Inc.	4.44	0.63	16.4
SNE	157.37	54.96	Sony	101.63	-1.56	-1.5
SUNW	106.75	32.93	Sun Microsystems	90.56	4.00	4.5
TMCO	22.75	3.75	Tricord Systems	20.63	0.69	3.4
UIS	49.68	13.25	Unisys (L)	13.50	0.06	0.5
INTERNET UP 3.0%						
AMZN	113.00	32.46	Amazon.com	47.06	6.06	16.8
AOL	95.81	38.46	America Online	61.19	3.88	6.8
ATHM	59.75	15.87	Athome Corp.	19.44	0.19	1.0
CKFR	125.62	23.12	Checkfree	60.31	8.75	17.0
CYCH	16.00	4.75	Cybercash Inc.	5.63	-0.94	-14.3
EBAY	127.50	35.14	eBay Inc.	60.88	11.06	22.2
ETYS	96.00	4.50	eToys Inc.	5.63	0.19	3.4
EGRP	42.62	13.12	E*Trade Group Inc.	19.13	3.13	19.5
LCOS	90.62	28.56	Lycos Inc.	49.13	-0.44	-0.9
OMKT	65.50	7.87	Open Market Inc.	9.56	-3.38	-31.4
OTEX	50.62	9.50	Open Text Corp.	20.13	-0.13	-0.6
PCLN	118.37	22.37	Priceline.com Inc. (L)	40.13	2.44	6.5
PRGX	35.43	6.25	Prodigy Communications	10.38	0.63	6.4
PSIX	60.93	15.53	PSINet Inc.	20.88	1.63	7.2
RSAS	93.06	15.87	Security Dynamics	71.00	2.00	2.7
SPYS	95.25	9.68	Spyglass Inc.	38.06	1.38	3.7
WINK	75.00	6.00	Wink Communications Inc.	27.06	0.56	2.0
YHOO	250.06	65.00	Yahoo Inc.	126.88	11.13	9.6
STORAGE & PERIPHERALS UP 2.0%						
ADPT	63.56	15.37	Adaptec Inc.	20.38	-0.56	-2.7
APCC	45.87	16.00	American Power Conversion (H)	44.13	1.56	3.7
CANNY	51.75	25.75	Canon Inc.	49.50	1.25	2.5
DBD	32.87	19.68	Diebold Inc.	28.25	0.63	2.2
EK	78.25	53.18	Eastman Kodak Co.	61.06	1.13	1.8
EMC	82.62	26.25	EMC	80.06	2.94	3.8
IOM	6.37	2.87	Iomega	4.19	0.13	3.1
MXTR	14.81	4.62	Maxtor Corp.	10.50	0.13	1.2
NTAP	124.00	12.43	Network Appliance Inc.	96.00	14.13	17.3
LPX	125.87	56.00	Lexmark International Group Inc.	59.88	1.44	2.3
SEG	75.43	25.12	Seagate Technology	63.44	4.56	7.7
STK	27.18	10.62	Storage Technology	11.38	0.06	0.6
TEK	87.37	27.12	Tektronix (H)	80.69	1.94	2.4
XRX	60.31	18.50	Xerox	20.25	0.06	0.3

KEY: **(H)** = New annual high reached in period
(L) = New annual low reached in period

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With Wireless, Bank Enters 'New Frontier'

Wachovia responds early to perceived consumer interest and new technology

BY MATT HAMBLEN

WACHOVIA CORP. knew a year ago that wireless banking would be key to hanging on to its customers.

And its announcement last week of an upcoming pilot project that will let customers bank from handheld computers and smart phones seems to have come just in time, as a half-dozen of Wachovia's competitors have recently come forward with similar news.

"We knew a year ago that mobile banking was the next frontier," said Lawrence Baxter, head of e-business at Wachovia. "You had coming together consumer interest on the one hand and wireless technology on the other."

Imminent Rollout

The $68 billion-in-assets bank's pilot projects will lead to rollouts for corporate customers by the fourth quarter and consumers by the first quarter of next year, initially allowing wireless monitoring of accounts and then actual cash transfers, bill payments and stock trades.

It will be perhaps the first rollout of wireless banking in the U.S. for corporate accounts, analysts said, giving company treasurers and chief financial officers the ability to monitor huge cash transfers wirelessly and, soon, to authorize the transfers securely.

"Every hour that cash sits, it costs a company money," Baxter said. "This would help people on the move like treasurers ensure that a cost-saving transfer was made."

Rather than build security solutions from scratch, Winston-Salem, N.C.-based Wachovia followed the lead of other banks deploying wireless technology and hired wireless integrator 724 Solutions Inc. in Toronto.

Analysts Alan Reiter at Wireless Internet and Mobile Computing in Chevy Chase, Md., and John Pescatore at Gartner Group Inc. in Stamford, Conn., described 724 as a leader in wireless banking integration work.

Among the security protections 724 is adding for Wachovia is automatic notification of customers by e-mail or voice mail if wireless transactions crash so they would know whether their transactions were completed.

The data will be encrypted on a virtual private network over the Internet, and users will be authenticated with private user names and passwords, Baxter said. Ideally, phone manufacturers and carriers will begin supporting the use of smart cards that authenticate users before access on a wireless device is granted, he added.

The main benefit of working with 724 is that it will make arrangements for network reliability and security with any wireless carrier, Baxter said.

724 will also program and test all types of wireless devices to ensure that they don't drop connections with Wachovia's Web server and that the data being transmitted conforms to the keypad and screen of the device it is being sent to, Baxter said.

Wachovia information technology staffers will monitor the pilot alongside 724 advisers to deal with security issues.

WACHOVIA'S LAWRENCE BAXTER: Interest and technology come together

"We have watched every security angle and have talked to other banks in a spirit of co-opetition," Baxter said. "On that part, we're all absolutely willing to share."

Baxter wouldn't divulge the cost of the wireless implementation, adding that it has been "virtually impossible" to come up with a reliable return-on-investment estimate.

"We have some rough estimates, but the truth is that you're on a new frontier with wireless," he said. "But I've got the trust of the company that this is a new bet, and we're all sort of willing to take the risk."

Continued from page 1

Wireless

of consumers are "highly interested in using wireless banking services," said Mark Dickelman, senior vice president of wireless and mobile commerce at Harris, who cited a survey by Global Concepts Inc. in Norcross, Ga. "The interest is very high."

According to the survey, 27% of North American respondents are "extremely interested or interested" in wireless financial services.

Other banks have also found a high level of interest. At Winston-Salem, N.C.-based Wachovia Corp., which plans to begin a pilot project in the next few weeks (see story above), customers have begun asking for wireless services.

"The actual consumer adoption rate of mobile devices is escalating and will greatly exceed PCs in the next couple of years," said Lawrence Baxter, the bank's head of e-business, explaining why the bank decided to jump to wireless now. Neither Harris nor Wachovia would disclose how much the wireless banking projects cost.

Five U.S. banks have announced plans to offer wireless services; all are clients of Toronto-based 724 Solutions Inc., which provides an interface between banks and wireless devices. Its two main competitors in this market — New York-based W-Trade Technologies Inc. and Atlanta-based S1 Corp. — say they will make major wireless banking announcements in the next few weeks.

And a deal announced last week paves the way for many other banks to sign up for wireless services. Norcross, Ga.-based CheckFree Corp., a provider of online banking services such as bill payment, announced a deal with 724 Solutions that will let its customers, including about 350 financial institutions, sign up for wireless banking starting early this fall.

Still, one unknown is how quickly customers will overcome security concerns and adopt the wireless services, said Richard Bell, an analyst at Needham, Mass.-based TowerGroup.

"If you were to take all the institutions in the U.S. that are doing wireless banking and total up the total number of consumers they're working with, you'll have less than 15,000 people," he said. "People are very worried about initiating a transaction — for security and liability both."

Widespread adoption of wireless banking is still five to 10 years off, Bell said.

"In the U.S., the billing model is such that it doesn't make much sense," he said. While Americans prefer to pay their bills by check, many Europeans use automatic deductions to pay their bills, he explained, and wireless banking is catching on faster there as a result.

Security Getting Better, Isn't a Barrier, Analysts Say

Security for wireless banking transactions does have its weaknesses, but security analysts said banks and users can bolster security protections.

"Security is not a reason to slow down growth of wireless banking, but it is a responsibility of the [banks] to continually improve so they don't get embarrassed by loss of [personal identification numbers] or passwords," said Alan Paller, director of research at the SANS Institute in Bethesda, Md., and a *Computerworld* columnist.

Paller and two other analysts said wireless transactions are vulnerable to hacks at the Wireless Application Protocol (WAP) gateway server, which sits at the site of the wireless carrier today.

The current WAP standard, WAP 1.1, "leaves much to be desired," but WAP 1.2 is "much better" for security, said Alan Reiter, an analyst at Wireless Internet and Mobile Computing in Chevy Chase, Md.

WAP 1.2 will be updated later this year, allowing wireless carriers to transport encrypted wireless data through the gateway and out to the desired Web site, such as a bank. Today, that encryption is dropped momentarily as the data is converted from WAP to the wired world, analysts said. Even that moment is enough time for a skilled hacker to retrieve data such as credit-card numbers and passwords, analysts said.

When WAP 1.2 is more fully implemented, the gateway server can be placed at a bank's premises, which is more secure than at the phone company's premises, said John Pescatore, an analyst at Gartner Group Inc. in Stamford, Conn.

Pescatore, Reiter and banks say something more than a user name and a password should be required to authenticate smart phones or personal digital assistants. For a company treasurer, two smart cards that interact with a wireless device to authorize a money transfer of great value might be necessary, Pescatore said. – *Matt Hamblen*

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FRANK HAYES/FRANKLY SPEAKING

Remaking Microsoft

MULTIPLE CHOICE: Microsoft.Net is Microsoft Corp.'s way of (a) reinventing the mainframe, (b) reinventing the Internet or (c) reinventing the PC.

Tough call, eh?

Microsoft hates the idea of PCs having to connect to a host computer to do something useful. It's not just Bill Gates — Microsoft's whole corporate culture despises the mainframe as the collapsed legacy of past technology on whose rubble the company's wealth and power have been built. Pinning Microsoft's future on Windows-reinvented-as-a-mainframe isn't just unthinkable, it's absurd.

Then there's the Internet, another absurdity for a different reason: It's built on other people's software, software that Microsoft has no way of defining or controlling. You can't build an empire based on cooperation — you've got to have control. That's also fundamental to Microsoft's corporate culture.

And the PC? It's been the core of Microsoft's culture for almost two decades. In 1981, Microsoft's hot product was a plug-in circuit card that let Apple II users run CP/M — an operating system Microsoft didn't make. But ever since, the PC and its software have been the company's bread and butter — and heart and soul. Reinventing them as a set of distributed services is an idea that has to leave a lot of folks in Redmond queasy.

And that's a problem — for Microsoft, sure, but also for the rest of us. Because while Microsoft is fighting with itself over what .Net will be and do, we can't make plans.

We can't make plans while we're waiting for .Net.

Look at the trouble Microsoft executives had last week just describing .Net. Paul Maritz probably gave the simplest description, calling it a shift from client/server to "client/server/services." Bill Gates' best shot was saying that "everything that was an application becomes a Web site." Steve Ballmer gushed about the wonders of XML and user interfaces.

Not exactly a consistent vision, is it? It isn't just the products and services that haven't been rolled out. Right now, it sounds like the whole *idea* of .Net is pre-alpha.

So is this vapor-vision? I doubt it. I think .Net is all about the end of the PC as Microsoft has known it for two decades — the PC that's central to the user's experience, the PC that runs the applications and gives the user computing independence. That's all over, according to .Net.

Which, of course, means that the core of the Microsoft corporate culture is all over, too.

And no matter how important that change is, no matter how crucial driving a stake through the heart of the PC may be to Microsoft's future, it's going to tear the company apart more ruthlessly than any judge.

Unfortunately, there's no near-term upside to this split — not for Microsoft, and not for us. .Net will change furiously in the months to come — not due to the usual technical problems but because, at heart, Microsoft won't want to make this revolutionary change.

That means we won't know what we'll be getting. .Net could end up as nothing more than a scheme for downloading applications from the Internet if Microsoft loses its resolve to reinvent itself. Or if the company embraces the .Net idea completely, Microsoft could radically reimagine and redefine computing.

Which will it be? Which do we *need* it to be? Ordinarily, I'd just wait for your comments by e-mail (and you're always happy to oblige). This time, though, I'm trying something different: I've agreed to host a forum at *Computerworld Online*. Go to the Web site, and on the left-side menu under Opinions, click on Forums to find the .Net forum.

Then let us know whether you think .Net will become a trivial change or a real revolution, whether Microsoft can pull it off — and whether it will be worth the trouble.

Hayes, Computerworld's staff columnist, has covered IT for more than 20 years. His e-mail address is frank_hayes@computerworld.com.

SHARK TANK

NOW THAT ORACLE is in the trash-collection business, this dot-com headed up by former Microsoft execs is getting more serious about garbage security. Well, sort of. The big plastic trash bin next to the copier now has a combination lock on the lid. "Bet the lock combo is the same as the company's phone number," a pilot fish jokes to a co-worker. They try it. "Sure enough," the fish reports, "it opens the lock."

DEAD ZONE A pilot fish working on the database for a hospital volunteer group gets a user request for database updates when someone dies. No problem, says the fish; we can add fields for users to put in the information. "No," say users, "we want it automatically updated when somebody dies so we'll know when to send flowers."

HARDWARE PROBLEM An e-business guru at a big wholesale hardware outfit plans to send out 40,000 electronic catalogs on CD-ROM. But a month before they're due to be mailed, he can't send a test order using the CD. Programmer pilot fish can't either; the server seems to be tied up. Turns out the server has a fast CPU, a big hard drive – and a single 28.8K bit/sec. modem.

DON'T GET ME WRONG IT managers can't make any sense of the IT director's plan to reorganize the department – each one has a different understanding of what the boss meant in the meeting when it was announced. This pilot fish asks the director for clarification, eliciting this helpful response: "I was intentionally vague so that no one would get the wrong idea."

THIS IT SERVICE PROVIDER sends the troops a memo urging them all to become better informed about viruses by reading the attached Word file describing what viruses are, how they're spread and how to avoid them. Next day, another companywide e-mail hits the mailboxes, "urging us not to open the attachment sent out the previous day," a pilot fish says. "Apparently, it contained the Word B virus."

Pilot fish reports that the Web site for the Virginia Department of Motor Vehicles lists local numbers for patrons to call, followed by this message: "Our call center is currently closed." Sharky checked it out, and actually, that's a live-update message. During the day, it almost always says – hey, this is the DMV, after all – "All customer service representatives are currently busy." Get busy sending me your true tales of IT: **sharky@computerworld.com**. If it prints, you get a sharp Shark shirt. And get more online daily, and the Sharkives, too, at *computerworld.com/sharky*.

The 5th Wave

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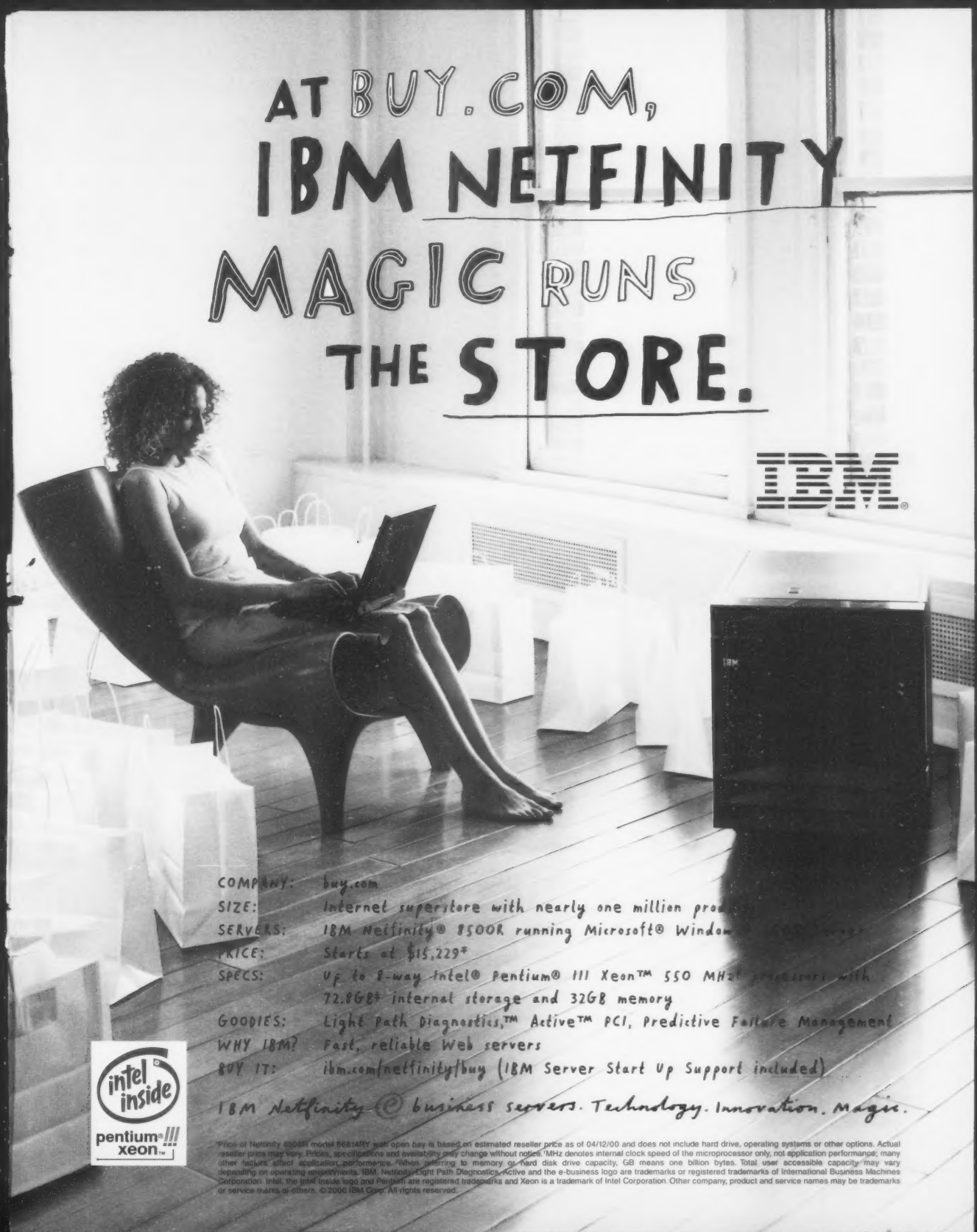

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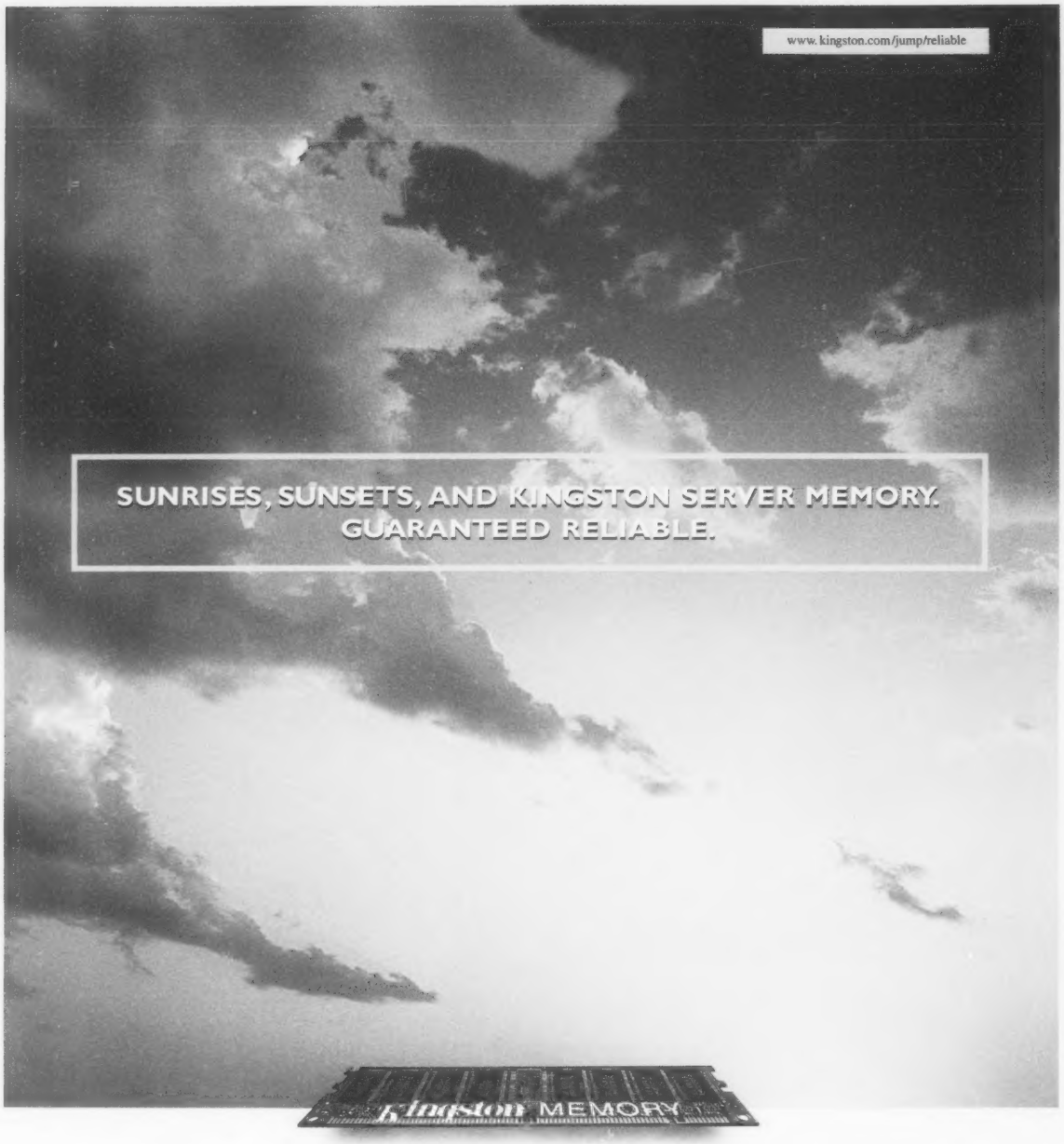

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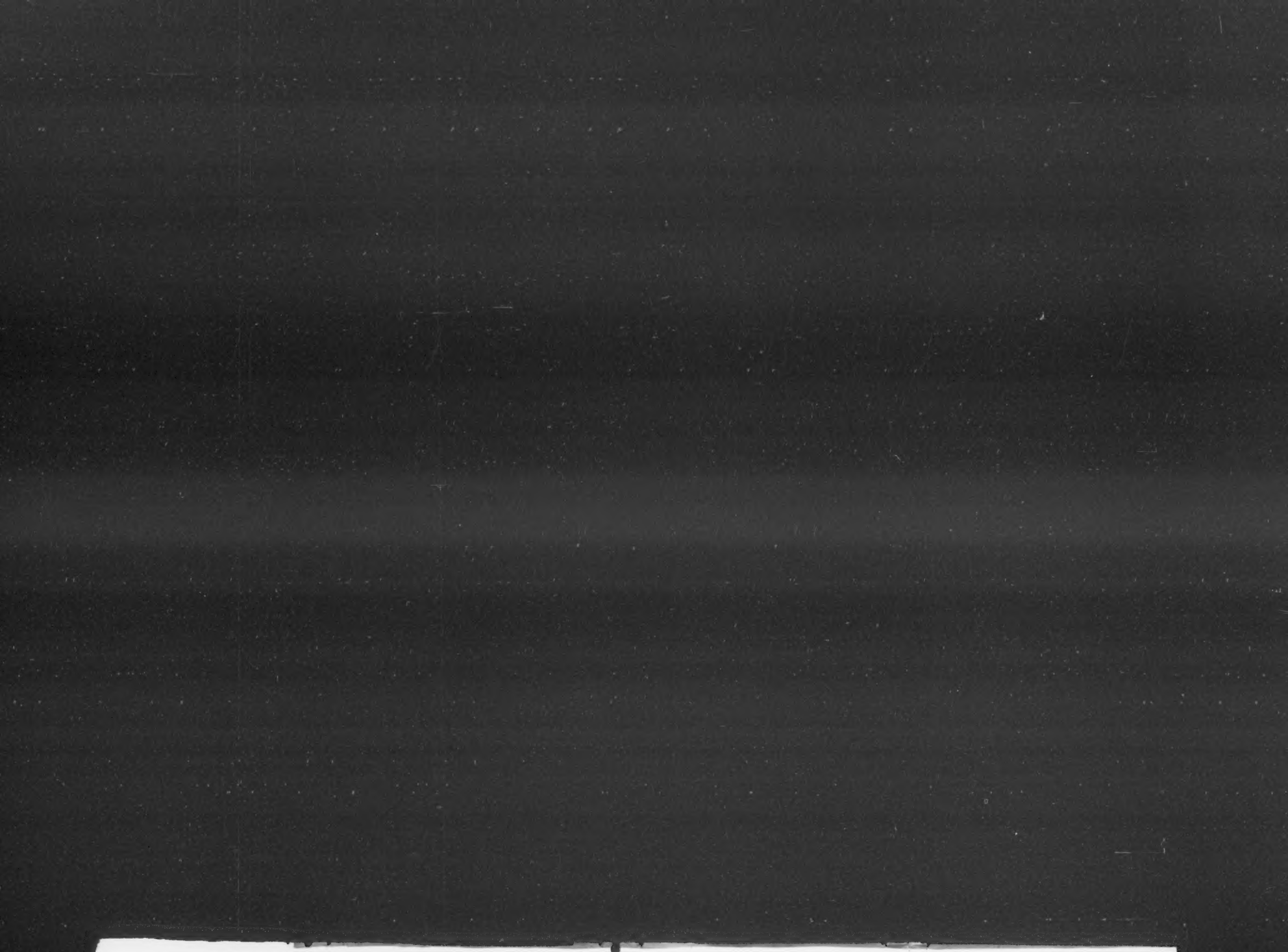
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